PIXMA MP170
PIXMA MP450

SERVICE MANUAL

Canon

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PIXMA MP170

PIXMA MP450

SERVICE MANUAL

Revision 0

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Scope

This manual has been issued by Canon Inc., to provide the service technicians of this product with the information necessary for qualified persons to learn technical theory, installation, maintenance, and repair of products. The manual covers information applicable in all regions where the product is sold. For this reason, it may contain information that is not applicable to your region.

Revision

This manual could include technical inaccuracies or typographical errors due to improvements or changes made to the product. When changes are made to the contents of the manual, Canon will release technical information when necessary. When substantial changes are made to the contents of the manual, Canon will issue a revised edition.

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I. MANUAL OUTLINE

This manual consists of the following three parts to provide information necessary to service the PIXMA MP170 / MP450:

Part 1: Maintenance
Information on maintenance and troubleshooting of the PIXMA MP170 / MP450

Part 2: Technical Reference
New technology and technical information such as FAQ's (Frequently Asked Questions) of the PIXMA MP170 / MP450

Part 3: Appendix
Block diagrams and pin layouts of the PIXMA MP170 / MP450

Reference:
This manual does not provide sufficient information for disassembly and reassembly procedures. Refer to the graphics in the separate Parts Catalog.

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3. SPECIFICATIONS

Part 1

MAINTENANCE

1. MAINTENANCE

1-1. Adjustment, Periodic Maintenance, Periodic Replacement Parts, and Replacement Consumables by Service Engineer

(1) Adjustment

Adjustment	Timing	Purpose	Tool	Approx. time
EEPROM initialization (EEPROM settings)	At logic board ass'y replacement	To initialize settings other than the following: - USB serial number - Destination setting - Waste ink counter	None.	1 min.
Destination settings (EEPROM settings)	At logic board ass'y replacement	To set the destination.	None.	1 min.
LCD language settings	At logic board ass'y replacement	To set the language to be displayed on the LCD.	None.	1 min.
Waste ink counter resetting (EEPROM settings)	- At bottom case unit replacement MP170: QM2-2800-000 MP450: QM2-2814-000 - At ink absorber replacement MP170: QY5-0149, QC1-6014 MP450: QY5-0151, QC1-6014	To reset the waste ink counter.	None.	1 min.
Document pressure sheet position adjustment	- At document cover unit replacement - At scanning unit replacement	To adjust the pressure sheet to fit in place to the four corners of the platen glass when the cover is closed	None.	1 min.
Print head alignment	- At print head replacement - At logic board ass'y replacement - At carriage unit replacement	To ensure accurate dot placement.	- Machine buttons - Computer (settings via the MP driver)	2 min.
Paper feed motor position adjustment*1	At paper feed motor unit replacement	To adjust the belt tension. (Position the paper feed motor so that the belt is stretched tight.)	None.	2 min.
Grease application	- At carriage unit replacement - At bottom case unit replacement - At platen replacement - At eject roller replacement - At cap blade unit replacement -	- To maintain sliding properties of the carriage, cap blade unit, and eject rollers.	- FLOIL KG-107A (QY9-0057) - MOLYKOTE PG641 (CK-0562)	1 min.

*1: Red screws of paper feed motor
The red screws securing the paper feed motor may be loosened only at replacement of the paper feed motor unit.

(2) Periodic maintenance

No periodic maintenance is necessary.

(3) Periodic replacement parts

There are no parts in this machine that require periodic replacement by a service engineer.

(4) Replacement consumables

There are no consumables that require replacement by a service engineer.

1-2. Customer Maintenance

Adjustment	Timing	Purpose	Tool	Approx. time
Print head alignment	When print quality is not satisfying.	To ensure accurate dot placement.	- Machine buttons (automatic alignment by scanning the head alignment sheet) - Computer (manual alignment via the MP driver)	3 min.
Print head cleaning	When print quality is not satisfying.	To improve nozzle conditions.	- Machine button - Computer (settings via the MP driver)	1 min.
Print head deep cleaning	When print quality is not satisfying, and not improved by print head cleaning.	To improve nozzle conditions.	- Machine button - Computer (settings via the MP driver)	2 min.
Ink cartridge replacement	When an ink cartridge becomes empty. (No ink error)	-----	-----	2 min.
Paper feed roller cleaning	When paper does not feed properly.	To clean the paper feed rollers.	Machine button	2 min.
Bottom plate cleaning	When the back side of the paper is smeared	To clean the platen ribs.	- Machine button - Computer (settings via the MP driver)	1 min.

1-3. Product Life

(1) Machine

Specified print volume (I) or the years of use (II), whichever comes first.

(I) Print volume

		MP170 / MP450
		8,000 pages
Black	1,500 character pattern	4,000 pages
Color	A4, 7.5% duty per color pattern	3,200 pages
	A4, 30 % duty per color pattern	160 pages
	4 x 6, 30 % duty per color pattern	400 pages
	Postcard, 30 % duty per color pattern	240 pages

(II) Years of use

5 years of use

(2) Ink cartridge (ink tank with nozzles) (target value)

	Standard		High capacity	
	BK	CL	BK	CL
	PG-40	CL-41	PG-50	CL-51
1,500 character pattern plain paper, standard mode (BK)	490 pages	-	750 pages	-
ISO JIS-SCID No. 5 plain paper, standard mode (BK)	760 pages	-	1,170 pages	-
ISO JIS-SCID No. 5 plain paper, standard mode (CL)	-	190 pages	-	320 pages
Digital camera 24 images PP-101 4x6	-	100 pages	-	180 pages

1-4. Special Tools

Name	Tool No.	Application	Remarks
MOLYKOTE PG-641	QY9-0035-000	To be applied to the chassis.	In common with other models.
FLOIL KG-107A	QY9-0057-000	To be applied to the sliding portion of the carriage, and the platen link.	In common with other models.

1-5. Serial Number Location

On the chassis (visible when the scanning unit is open).

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<Part 1: 1.MAINTENANCE>

2. LIST OF ERROR DISPLAY / INDICATIONS

Errors and warnings are displayed by the following ways:

1) Operator call errors are indicated by the Alarm LED lit. (In the service mode, the Alarm LED blinks to indicate errors.)

   Service call errors are indicated by the number of cycles the Alarm and Power LEDs blink.

2) Errors and warnings are displayed on the LCD on the operation panel.

3) Warnings are displayed on the MP driver Status Monitor.

2-1. Operator Call Errors (by Alarm LED Lit in Orange)

MP450 LCD	MP170 LCD	Alarm LED blinking in orange (in the service mode only)	Error [Error code]	Solution	Remarks
There is no paper.	LOAD PAPER	2 times	No paper. (ASF) [1000]	Set the paper in the ASF, and press the OK button.	
The paper is jammed.	PAPER JAMMED	3 times	Paper jam. [1300]	Remove the jammed paper, and press the OK button.	
Ink has run out. Replace the ink cartridge and close the cover. U041	CHECK INK U041	-	No ink. [1600]	Replace the empty ink cartridge(s), or press the OK button.	Pressing the OK button will exit the error without ink cartridge replacement, however, ink may run out during printing.
The following ink cartridge cannot be recognized. U051 / U059	CHECK INK U051 / U059	5 times	Ink cartridge not installed. [1401] Ink cartridge not for this model installed. [1485]	Confirm that the ink cartridges are for this model, install them properly, then close the scanning unit.	
The following ink cartridge cannot be recognized. U052	CHECK INK U052	15 times	Ink cartridge not installed. [1682]	Re-install the applicable ink cartridge (s) properly, and close the scanning unit. Or, with the ink cartridges installed, turn the machine off and on again.	
The following ink cartridge cannot be recognized. U053	CHECK INK U053	4 times	Improper installation of an ink cartridge. [1687]	Re-install the applicable ink cartridge (s) properly, and close the scanning unit.	
The waste ink absorber is almost full.	WASTE INK NEAR FULL	-	Warning: The waste ink absorber becomes almost full. [1700 for the main waste ink absorber, 1710 for the platen waste ink absorber]	Pressing the OK button will clear the error, and enable printing. **At repair[*1]:** For main waste ink absorber replacement, replace - the bottom case unit (MP170: QM2-2800 MP450: QM2-2814), or - the ink absorber kit (MP170: QY5-0149	The service call error, indicating the waste ink absorber is full, is likely to occur soon.

				MP450: QY5-0151) For platen ink absorber replacement, replace - the ink absorber (QC1-6014) , and - the ink absorber kit (MP170: QY5-0149 MP450: QY5-0151).	
Incompatible device detected.	INCOMPATIBLE CAMERA	-	The connected digital camera or digital video camera does not support Camera Direct Printing. [2001]	Remove the cable between the camera and the machine, press the Stop/Reset button, then re-connect the cable.	
The following ink may have run out. U161 An ink cartridge that was once empty is installed. U162	CHECK INK U161 U162	-	Remaining ink amount unknown. [1685/1686]	A once-used ink cartridge (except the one which has been used until just before replacement) is installed. Replace the applicable ink cartridge with a new one, or press the OK button.	Pressing the OK button will exit the error without ink cartridge replacement, however, the function to detect the remaining ink amount is disabled.
Failed to scan head alignment sheet.	HEAD ALIGNMENT ERROR	-	Failed in scanning the print head alignment sheet.	Press the OK button to exit the error, and do the print head alignment again (from printing of the print head alignment sheet), while confirming the following: - Set A4 or LTR size plain paper. - Confirm that the print head alignment sheet is printed properly (no smear or non-ejection of ink). - Fill in all the applicable boxes in the printed sheet. - Place the sheet on the platen glass in the correct position and orientation.	
Cover is open.	COVER IS OPEN	-	Scanning unit open. [1200]	Close the scanning unit.	

*1: The main waste ink absorber is separate from the platen waste ink absorber. In servicing, replace the waste ink absorber which becomes full.

[See Section 3-3. Adjustment / Settings, (7) Service mode, for details.]

2-2. Service Call Errors (by Cyclic Blinking in Orange (Alarm LED) and Green (Power LED), or Alarm LED Lit in Orange)

Cycles of blinking in orange (Alarm LED) and green (Power LED)	Error [Error code]	Solution (Replacement of listed parts, which are likely to be faulty)
2 times	Carriage error [5100]	- Carriage unit (QM2-2136) - Timing slit strip film (QC1-6015) - Logic board ass'y (MP170 QM2-3210, MP450 QM2-3231)*1 - Carriage motor (QM2-3165)
3 times	Paper feed error [6000]	- Timing sensor ass'y (QM2-3167) - Timing slit disk film (QC1-4962) - Feed roller ass'y (QL2-0905) - Platen (QC1-6013) - Logic board ass'y (MP170 QM2-3210, MP450 QM2-3231)*1 - Paper feed motor (QM2-3166)
4 times	Purge unit error [5C00]	- Carriage unit (QM2-2136) - Timing slit strip film (QC1-6015) - Logic board ass'y (MP170 QM2-3210, MP450 QM2-3231)*1 - Carriage motor (QM2-3165)- Carriage motor (QM2-3165)
5 times	ASF (cam) sensor error [5700]	- Drive ass'y (QM2-2130) - PE sensor ass'y (QM2-3168) - Pressure roller ass'y (QM2-3336)
6 times	Internal temperature error [5400]	- Logic board ass'y (MP170 QM2-3210, MP450 QM2-3231)*1
7 times	Waste ink absorber full [5B00]*2	**Main waste ink absorber:** - Bottom case unit (MP170 QM2-2800, MP450 QM2-2814)*3 - Ink absorber kit (MP170 QY5-0149, MP450 QY5-0151) **Platen waste ink absorber:** - Ink absorber (QC1-6014) - Ink absorber kit (MP170 QY5-0149, MP450 QY5-0151)
8 times	Cartridge temperature rise error [5200]	- Print head - Logic board ass'y (MP170 QM2-3210, MP450 QM2-3231)*1
9 times	EEPROM error [6800]	- Logic board ass'y (MP170 QM2-3210, MP450 QM2-3231)*1
13 times	Paper feed position error [6B00]	- Paper feed motor (QM2-3166) - Paper feed belt (QC1-5194) - Logic board ass'y (MP170 QM2-3210, MP450 QM2-3231)*1
15 times	USB Host VBUS overcurrent [9000]	- Logic board ass'y (MP170 QM2-3210, MP450 QM2-3231)*1
17 times	Motor driver error [6D00]	- Logic board ass'y (MP170 QM2-3210, MP450 QM2-3231)*1
20 times	Other hardware error [6500]	- Logic board ass'y (MP170 QM2-3210, MP450 QM2-3231)*1
22 times	Scanner error [5010]	- Scanner unit (MP170 QM2-2798, MP450 QM2-2812) - Logic board ass'y (MP170 QM2-3210, MP450 QM2-3231)*1

Continuous alternate blinking	ROM error	- Logic board ass'y (MP170 QM2-3210, MP450 QM2-3231)*1
Lights in orange	RAM error	- Logic board ass'y (MP170 QM2-3210, MP450 QM2-3231)*1

*1: Before replacement of the logic board ass'y, check the waste ink amount, and re-set the waste ink amount value in the replaced logic board.
[See Section 3-3. Adjustment / Settings, (7) Service mode, for details.]

*2: The main waste ink absorber is separate from the platen waste ink absorber. In servicing, replace the waste ink absorber which becomes full.
[See Section 3-3. Adjustment / Settings, (7) Service mode, for details.]

*3: Reset the waste ink counter when replacing the bottom case unit. The main and platen waste ink counters can be reset separately.
[See Section 3-3. Adjustment / Settings, (7) Service mode, for details.]

2-3. Warnings

Machine (displayed on the LCD):

Displayed warning	Remarks
Low ink	
Print head temperature rise	If the print head temperature is high when the scanning unit is opened, the warning is displayed.*1 When the print head temperature falls, the warning is released.
Protection of excess rise of the print head temperature	If the print head temperature exceeds the specified limit, a Wait is inserted during printing,

*1: If the warning is displayed, the carriage does not move to the ink cartridge replacement position when the scanning unit is opened.

2-4. Troubleshooting by Symptom

	Symptom	Solution	Remarks
Faulty operation	The power does not turn on. The power turns off immediately after power-on.	Replace the - AC adapter, or - logic board ass'y[*1].	
	Strange noise.	Remove foreign material, or attach a removed part if any.	
	Printing stops mid-way.	Replace the logic board ass'y[*1].	
	Nothing is displayed on the LCD.	- Confirm the connection of the operation panel, scanner unit, and the logic board ass'y. - Replace the - operation panel, or - logic board ass'y.	
	A portion of the LCD is not displayed.	- Perform the button and LCD test in the service mode, and confirm that the LCD is displayed without any segments missing. - Confirm the connection of the operation panel, scanner unit, and the logic board ass'y. - Replace the - operation panel, or - logic board ass'y.	
Paper feed problems	Multiple sheets feed.	Replace the - drive unit, or - pressing plate ass'y.	
	Paper does not feed.	Remove foreign material, or replace the - drive unit, or - pressing plate ass'y.	
	Paper feeds at an angle.	Remove foreign material, or adjust the paper guide, or replace the - drive unit, or - pressing plate ass'y.	
Unsatisfactory	No printing, or no color ejected.	Replace the - ink cartridge[*2], - logic board ass'y[*1], - drive unit, or - cap blade unit.	
	Printing is faint, or white lines appear on printouts even after print head cleaning. Line(s) not included in the print data appears on printouts.	Remove and re-install the ink cartridges, or replace the - ink cartridge[*2], - cap blade unit, - purge unit, or - logic board ass'y[*1].	
	Paper gets smeared.	Feed several sheets of paper, perform bottom plate cleaning, or clean the paper path with cotton swab or cloth.	
	A part of a line is missing on printouts.	Replace the ink cartridge(s)[*2].	

print quality	Color hue is incorrect.	Replace the - ink cartridge*2, or perform print head alignment.	
	Printing is incorrect.	Replace the logic board ass'y*1.	
	No ejection of black ink.	Replace the ink cartridge(s)*2.	
	Graphic or text is enlarged on printouts.	When enlarged in the carriage movement direction, clean grease or oil off the timing slit strip film, or replace the - timing slit strip film, - carriage unit, or - logic board ass'y*1. When enlarged in the paper feed direction, clean grease or oil off the timing slit disk film, or replace the - timing slit disk film, - timing sensor unit, or - logic board ass'y*1.	
Faulty scanning	No scanning.	- Confirm the connection between the scanner unit and the logic board ass'y. - Replace the - scanner unit, or - logic board ass'y.	
	Streaks or smear on the scanned image.	- Clean the platen glass. - Confirm the connection between the scanner unit and the logic board ass'y. - Replace the - scanner unit, - logic board ass'y, or - document pressure sheet.	

*1: Before replacement of the logic board ass'y, check the waste ink amount, and re-set the waste ink amount value on the replaced logic board.
[See Section 3-3. Adjustment / Settings, (7) Service mode, for details.]

*2: Replace the print head only after the print head deep cleaning is performed 2 times, and when the problem persists.

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<Part 1: 2. LIST OF ERROR DISPLAY / INDICATION>

3. REPAIR

3-1. Notes on Service Part Replacement (and Disassembling / Reassembling)

Service part	Notes on replacement*1	Adjustment / settings	Operation check
Logic board ass'y MP170: QM2-3210 MP450: QM2-3231	- Before removal of the logic board ass'y, remove the power cord, and allow for approx. 1 minute (for discharge of capacitor's accumulated charges), to prevent damage to the logic board ass'y. - Before replacement, check the waste ink amount, and re-set the waste ink amount data in the replaced logic board ass'y. [See 3-3. Adjustment / Settings, (7) Service mode, for details.]	**After replacement:** 1. Initialize the EEPROM. 2. Set the waste ink data. 3. Set the destination in the EEPROM. 4. Set the LCD language. [See 3-3. Adjustment / Settings, (7) Service mode, for details of 1 to 4.] 5. Perform the print head alignment in the user mode.	- EEPROM information print - Service test print - Printing via parallel or USB connection - Direct printing from a digital camera - Direct printing from a memory card - Print Beam printing
Ink absorber QC1-6014	Platen waste ink absorber	**After replacement:** 1. Reset the platen waste ink counter. [See 3-3. Adjustment / Settings, (7) Service mode, for details.]	- Service test print
Bottom case unit MP170: QM2-2800 MP450: QM2-2814 Ink absorber MP170: QY5-0149 MP450: QY5-0151	Main waste ink absorber	**After replacement:** 1. Reset the main waste ink counter. [See 3-3. Adjustment / Settings, (7) Service mode.] 2. Adjust the head-to-paper distance. [See 3-3. Adjustment / Settings, (7) Service mode.]	- Service test print - Printing on thick paper
Carriage unit QM2-2136	The red screws on both sides of the main chassis securing the carriage shaft are allowed to be loosened only when replacing the carriage or removing the main chassis. Before removing the screws, mark the original screw position, and re-fasten them at the original position.	**At replacement:** 1. Apply grease to the sliding portions. [See 3-3. Adjustment / Settings, (4) Grease application.] 2. Adjust the distance between the carriage shaft and the platen. [See 3-3. Adjustment / Settings, (2) Main chassis and carriage rail adjustment.] 3. Perform the print head alignment in the user mode.	- Printing on thick paper
Paper feed motor unit QM2-3166	- The red screws securing the paper feed motor are allowed to be loosened. (DO NOT loosen any other red screws.)	**At replacement:** 1. Adjust the paper feed motor. [See 3-3. Adjustment /	

		Settings, (1) Paper feed motor adjustment.]	
Document pressure plate ass'y QM2-2809 Document pressure sheet QC1-7588 Scanner base unit MP170: QM2-2798 MP450: QM2-2812		**At sheet or unit replacement:** 1. Adjust the document pressure sheet. [See 3-3. Adjustment / Settings, (3) Document pressure sheet adjustment.]	
Timing slit strip film QC1-4962	- Upon contact with the film, wipe the film with ethanol. - Confirm no grease is on the film. (Wipe off any grease thoroughly with ethanol.) - Do not bend the film	**After replacement:** 1. Perform the print head alignment in the user mode.	- Service test print
Timing slit disk film QC1-4833			

*1: General notes:

- Make sure that the flexible cables and wires in the harness are in the proper position and connected correctly.
  [See 3-2. Special Notes on Repair Servicing, (1) Flexible cable and harness wiring, connection, for details.]
- Do not drop the ferrite core, which may cause damage.
- Protect electrical parts from damage due to static electricity.
- Before removing a unit, after removing the power cord, allow the machine to sit for approx. 1 minute (for capacitor discharging to protect the logic board ass'y from damages).
- Do not touch the timing slit strip film and timing slit disk film. No grease or abrasion is allowed.
- Protect the units from becoming soiled with ink.
- Protect the housing from scratches.
- Exercise caution with the red screws, as follows:
  i. The red screws of the paper feed motor may be loosened only at replacement of the paper feed motor unit (DO NOT loosen them in other cases).
  ii. Except for carriage replacement, DO NOT loosen the red screws (which secures the carriage shaft positioning) on both sides of the main chassis.
  After replacement of the carriage, print on thick paper to confirm that the distance between the carriage shaft and the platen is proper, and there is no contact of the ink cartridges to the paper.
  If the ink cartridges contact the paper, adjust the carriage shaft, while referring to [3-3. Adjustment / Settings, (2) Main chassis and carriage rail adjustment.]

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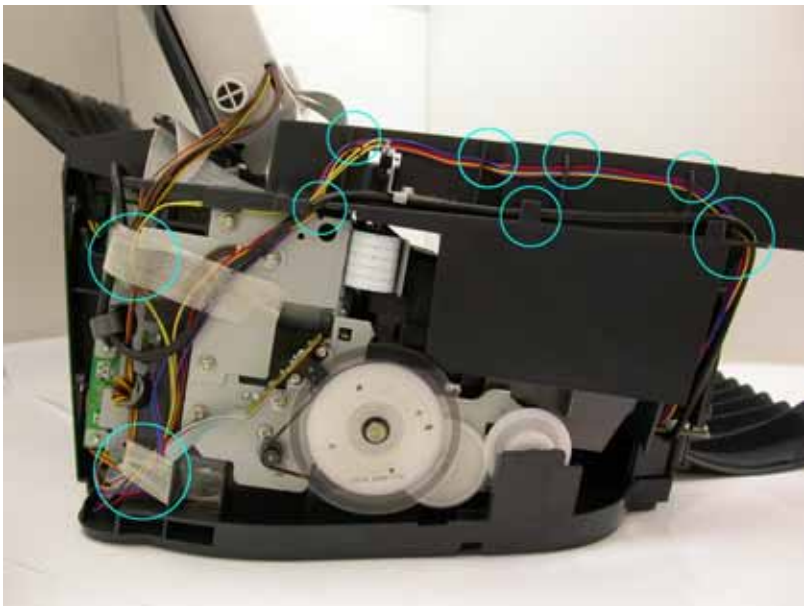
<Part 1: 3. REPAIR, 3-1>

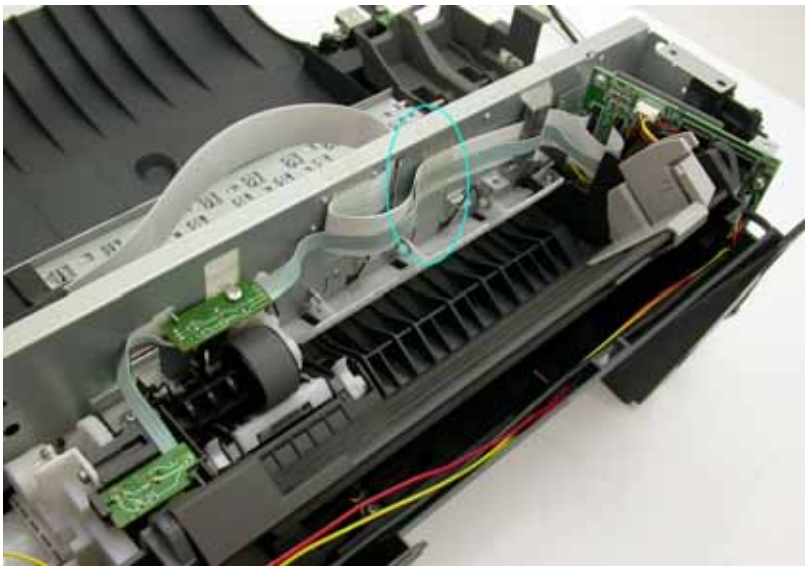
3-2. Special Notes on Repair Servicing

(1) Flexible cable and harness wiring, connection

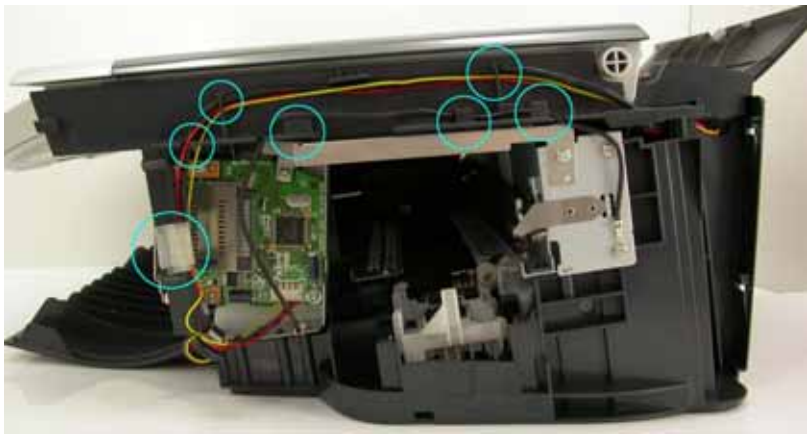
Be careful of wiring of the flexible cables and harness. Improper wiring or connection may cause breakage of a line, leading to ignition or emission of smoke.

(I) Logic board ass'y, PictBridge connector, and IrDA board wiring





(II) Card board wiring



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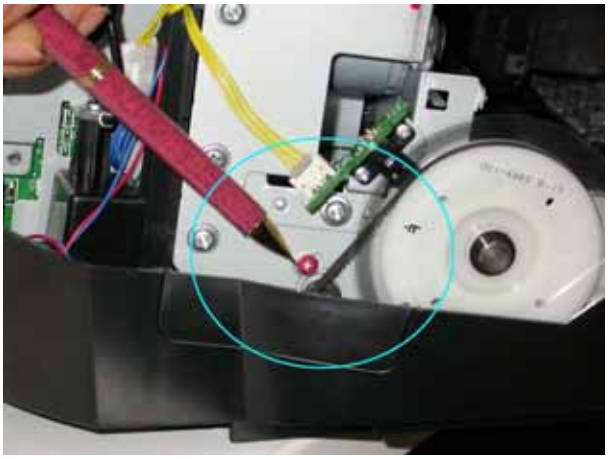
<Part 1: 3. REPAIR, 3-2>

3-3. Adjustment / Settings

(1) Paper feed motor adjustment

Perform the following adjustments when the paper feed motor unit is replaced:

1) When removing the screws, mark the 6 screw holes.



2) When installing the motor, position each screw to the mark, and fasten them.
3) After replacement, be sure to perform the service test print, and confirm that no strange noise or faulty print operation (due to dislocation of the belt or gear, or out-of-phase motor, etc.) occurs.

Note: The red screws securing the paper feed motor may be loosened only at replacement of the paper feed motor unit. DO NOT loosen them in other cases.

(2) Main chassis and carriage rail adjustment

[Carriage rail adjustment]

Perform the following adjustments when the carriage unit is replaced:

1) Before loosening the red screws, mark the boss position beside the screw.

2) In attaching the carriage rail, make sure that the boss fits into the hole and to the mark made in step 1), then fasten the screws.
3) Be sure to perform the confirmation test detailed below; confirm that the print quality is proper and the ink cartridges are not contacting the paper.

[Main chassis adjustment]

After installing the main chassis, be sure to perform the confirmation test detailed below; confirm that the print quality is proper and the ink cartridges are not contacting the paper.

<Confirmation test>

Using Photo Paper Pro, and with the paper thickness lever set to the left position (normal position), print an image and confirm that the print quality is proper, and the ink cartridges are free from contacting the paper.

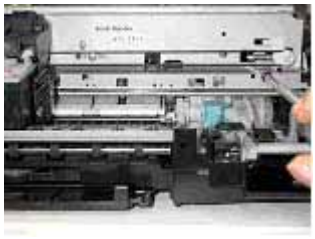
If the print quality is not proper, or an ink cartridge contacts the paper, adjust the head-to-paper distance in the following procedures:

Procedures for adjusting the head-to-paper distance:

i) At the bottom edge of the boss beside the red screw on each side of the chassis, put a mark to indicate the current position. (See the step 1 of the carriage rail adjustment above.)

ii) Loosen the red screws, and adjust the head-to-paper distance.

- To prevent the ink cartridges from contacting the paper: Raise the carriage rail from the current position.
- To improve the print quality: Lower the carriage rail from the current position.



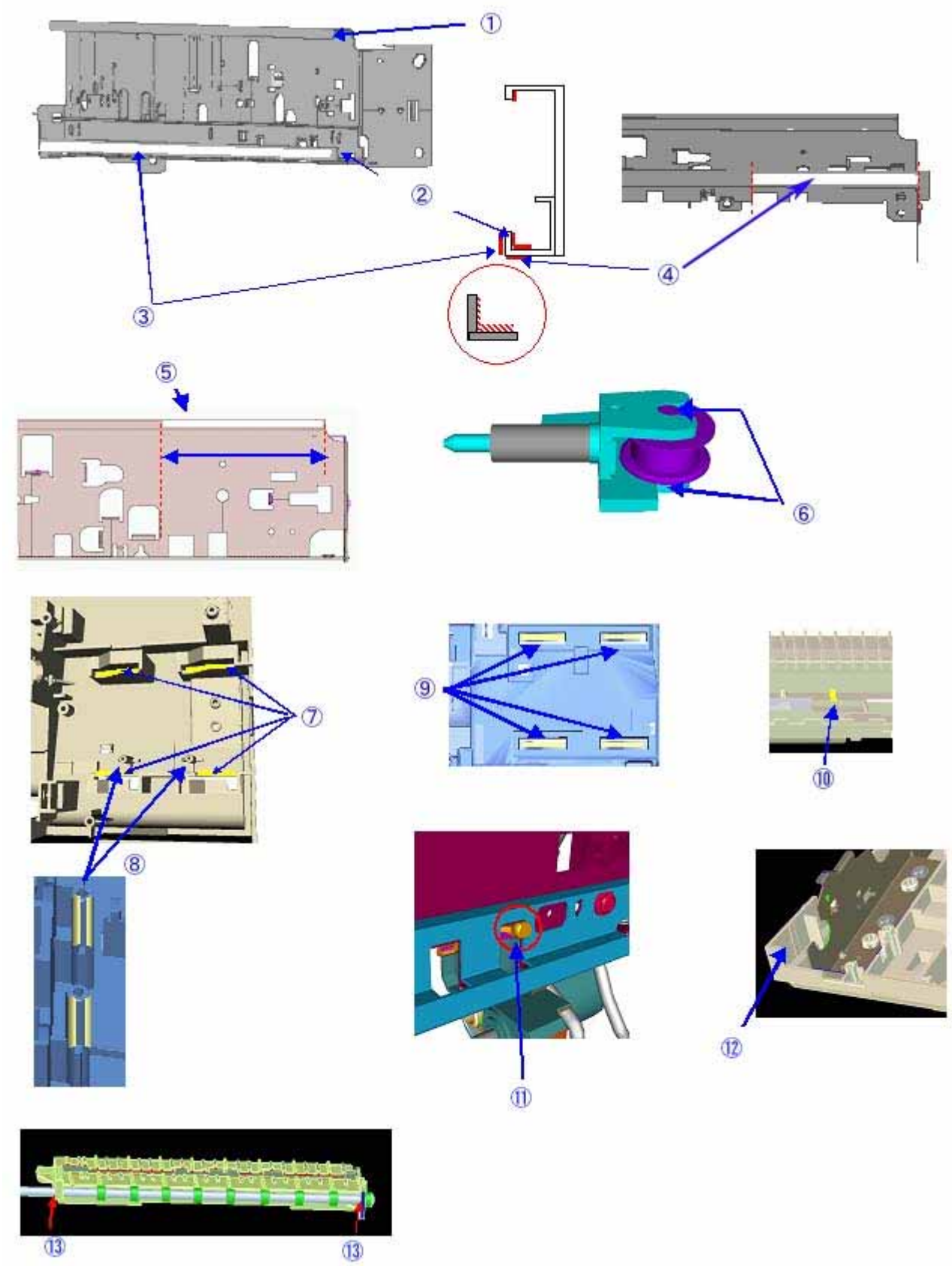
(3) Document pressure sheet adjustment

Perform the following adjustments when attaching the document pressure sheet:

1) Remove the cover sheet from the double-sided adhesive tape in the 4 corners of the document pressure sheet, and fit the document pressure sheet in the 4 corners of the platen glass with the adhesive tape side facing up.

2) Close the document pressure plate ass'y to fix the sheet to the ass'y.

(4) Grease application



Part name	Where to apply grease / oil		Grease / oil name	Grease / oil amount
Chassis	1	Entire contact surface of the carriage slider	FLOIL KG107A	100mg
	2	Inside of the rail	FLOIL KG107A	420mg
	3	Back of the rail	FLOIL KG107A	100mg
	4	Bottom of the rail	FLOIL KG107A	1 drop
	5	Carriage slider contact portion (front side)	FLOIL KG107A	1 drop
Idler pulley	6	Sliding portion	MOLYKOTE PG-641	1 drop
Bottom case unit	7	Slider shaft sliding portion (bottom case top)	MOLYKOTE PG-641	1 drop x 4 locations
	8	Slider shaft sliding portion (bottom case top)	MOLYKOTE PG-641	1 drop x 4 locations
	9	Slider shaft sliding portion (bottom case top)	MOLYKOTE PG-641	1 drop x 4 locations
	10	Platen link sliding portion	MOLYKOTE PG-641	1 drop
	11	Eject roller sliding portion	MOLYKOTE PG-641	Half drop
	12	Trigger arm (carriage sliding portion)	MOLYKOTE PG-641	1 drop
Platen	13	Eject roller sliding portion	FLOIL KG107A	Half drop x 2 locations

Note: 1 drop = 9 to 18 mg

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<Part 1: 3. REPAIR, 3-3 (1) to (4)>

(5) Waste ink counter setting

Before replacement of the logic board ass'y, check the waste ink amount, and re-set the waste ink amount value to the replaced logic board. In addition, according to the waste ink amount, replace the waste ink absorber (the bottom case unit or the ink absorbers). The standard amount for waste ink absorber replacement is given in the table below.

<Main waste ink absorber>

Waste ink amount*1	Bottom case unit or ink absorber kit replacement -Bottom case unit MP170: QM2-2800 MP450: QM2-2814 - Ink absorber kit MP170: QY5-0149 MP450: QY5-0151
Less than 7%	Not required.
7% or more	Required.

<Platen waste ink absorber>

Waste ink amount*1	Ink absorber (QC1-6014) replacement, and Ink absorber kit replacement MP170: QY5-0149 MP450: QY5-0151
Less than 7%	Not required.
7% or more	Required.

*1: Check the waste ink amount by service test print or EEPROM information print.
[See 3-3. Adjustment / Settings, (7) Service mode, for details.]

(6) User mode

Function	Procedures	Remarks
Nozzle check pattern printing	MP170, MP450: On standalone machine, press the Menu button to move to Maintenance, and perform the selection.	Also available from the MP driver Maintenance.
Print head cleaning	Cleaning both black and color: MP170, MP450: On standalone machine, press the Menu button to move to Maintenance, and perform the selection.	Also available from the MP driver Maintenance.
Print head deep cleaning	Cleaning both black and color: MP170, MP450: On standalone machine, press the Menu button to move to Maintenance, and perform the selection.	Also available from the MP driver Maintenance.
Automatic print head alignment	MP170, MP450: On standalone machine, press the Menu button to move to Maintenance, and perform the selection.	
Manual print head alignment	Perform from the MP driver Maintenance.	

Print head alignment value print	Print and confirm the print head alignment values set in the machine. MP170, MP450: On standalone machine, press the Menu button to move to Maintenance, and perform the selection.	Also available from the MP driver Maintenance. In the Maintenance tab, select Print Head Alignment and click Check Setting.
Paper feed roller cleaning	MP170, MP450: On standalone machine, press the Menu button to move to Maintenance, and perform the selection.	Also available from the MP driver Maintenance.
Bottom plate cleaning	MP170, MP450: On standalone machine, press the Menu button to move to Maintenance, and perform the selection.	Also available from the MP driver Maintenance. If the problem that smear is on the back side of the paper is not resolved by Bottom plate cleaning, clean the plate ribs.
Extended copy amount setting	MP170: On standalone machine, press the Menu button to move to System Settings and go to Print Settings, then perform the selection. MP450: On standalone machine, press the Menu button to move to Maintenance / Settings; select Device Settings, Print Settings, and perform the selection.	
Quiet mode setting	MP170: On standalone machine, press the Menu button to move to System Settings and go to Print Settings, then perform the selection. MP450: On standalone machine, press the Menu button to move to Maintenance / Settings, select Device Settings, then Print Settings, and perform the selection.	Also available from the MP driver Maintenance.
Wireless print setting	MP450 only: Wireless print settings such as paper type and print layout can be made. On standalone machine, press the Menu button to move to Maintenance / Settings, select Device Settings, then perform the selection.	
PictBridge print setting	MP170 only: PictBridge print settings such as paper type and borderless print can be made. Press the Menu button to move to System Settings and go to PictBridge Set, then perform the selection.	

Read/write attribute setting	MP170: Press the Menu button to move to System Settings and go to Others, then perform the selection. MP450: On standalone machine, press the Menu button to move to Maintenance / Settings; select Device Settings, Other Settings, and perform the selection.	
Power saving mode setting	A period of time before entering the power saving mode can be specified. MP170: Press the Menu button to move to System Settings and go to Others, then perform the selection. MP450: On standalone machine, press the Menu button to move to Maintenance / Settings; select Device Settings, Other Settings, and perform the selection.	
Contrast adjustment	MP450 only: The contrast of the LCD can be adjusted. On standalone machine, press the Menu button to move to Maintenance / Settings, select Device Settings, then Other Settings, and perform the selection.	
Slide show setting	MP450 only: The slide show display quality can be selected. On standalone machine, press the Menu button to move to Maintenance / Settings; select Device Settings, Other Settings, and perform the selection.	
Date display	MP170: Press the Menu button to move to System Settings and go to Others, then perform the selection. MP450: On standalone machine, press the Menu button to move to Maintenance / Settings; select Device Settings, Other Settings, and perform the selection.	
Language selection	The language to be used on the LCD can be selected. MP170: Press the Menu button to move to System Settings and go to Others, then perform the selection. MP450: On standalone machine, press the	

	Menu button to move to Maintenance / Settings; select Device Settings, Other Settings, and perform the selection.	
Reset	Settings are reset to the original shipping conditions. MP170: Press the Menu button to move to System Settings and go to Restore Default, then perform the selection. MP450: On standalone machine, press the Menu button to move to Maintenance / Settings; select Device Settings, then Reset Setting.	
Saving the settings	The current print settings are saved. MP170: Press the Menu button to move to System Settings, and select Save Confguration. MP450: On standalone machine, press the Menu button to move to Maintenance / Settings; select Device Settings, then Save Settings.	
Calling up the saved settings	The saved print settings are called up. MP170: Press the Menu button to move to System Settings, and select Load Confguration. MP450: On standalone machine, press the Menu button to move to Maintenance / Settings; select Device Settings, then Load Settings.	
Head-to-paper distance setting	Move the paper thickness lever to set the head-to-paper distance to Auto or Wide.	

(7) Service mode

Function	Procedures	Remarks
Service test print - Model name - ROM version - USB serial number - Waste ink amount - Destination settings	See "Service mode operation procedures" below.	Set a sheet of A4 or letter- sized paper. For a print sample, see 3-4. Verification Items, (1) Service test print, <Service test print sample>.
EEPROM information print	See "Service mode operation procedures" below.	Set a sheet of A4 or letter- sized paper. For a print sample, see 3-4. Verification Items, (2) EEPROM information print
EEPROM initialization	See "Service mode operation procedures" below.	The following items are NOT initialized: - USB serial number - Destination settings - Waste ink counter
Waste ink counter reset	See "Service mode operation procedures" below.	The main and platen waste ink counters can be reset separately. If the main waste ink amount is 7% or more, replace the bottom case unit or the ink absorber (inside the bottom case unit). If the platen waste ink amount is 7% or more, replace the platen ink absorber.
Destination settings	See "Service mode operation procedures" below.	After destination settings, make sure to initialize the EEPROM.
Button and LCD test	See "Service mode operation procedures" below.	Confirm the button and LCD operation. Perform this test at operation panel replacement.
Waste ink amount setting	See "Service mode operation procedures" below.	The main waste ink amount and the platen waste ink amount can be set separately.

Note: At the end of the service mode, press the Power button.

<Service mode operation procedures>

1) With the machine power turned off, while pressing the Stop/Reset button, press and hold the Power button. (DO NOT release the buttons. The Power LED lights in green to indicate that a function is selectable.)
2) While holding the Power button, release the Stop/Reset button. (DO NOT release the Power button.)
3) While holding the Power button, press the Stop/Reset button 2 times, and then release both the Power and Stop/Reset buttons. (Each time the Stop/Reset button is pressed, the Alarm and Power LEDs light alternately, Alarm in orange and Power in green, starting with Alarm LED.)
4) When the Power LED lights in green, press the Stop/Reset button the specified number of time(s) according to the function listed in the table below. (Each time the Stop/Reset button is pressed, the Alarm and Power LEDs light alternately, Alarm in orange and Power in green, starting with Alarm LED.)

Time(s)	LED indication	Function	Remarks
0 times	Green (Power)	Power off	
1 time	Orange (Alarm)	Service test print	See 3-4. Verification Items, (1) Service test print.
2 times	Green (Power)	EEPROM information print	See 3-4. Verification Items, (2) EEPROM information print.

3 times	Orange (Alarm)	EEPROM initialization	
4 times	Green (Power)	Waste ink counter resetting	
5 times	Orange (Alarm)	Destination settings	Proceed to the following step 5), and follow the Destination settings procedures.
6 times	Green (Power)	Print head deep cleaning	
11 times	Orange (Alarm)	Button and LCD test	Proceed to the following step 5), and follow the Button and LCD test procedures.
15 times	Orange (Alarm)	Waste ink amount setting	Proceed to the following step 5), and follow the Waste ink amount setting procedures.
12 to 14 times, 16 times or more		Return to the menu selection	

5) After the function (menu) is selected, press the Power button. The Power LED lights in green, and the selected function is performed. (When the operation completes, the machine returns to the menu selection mode automatically.)

<Destination settings procedures>

In the destination settings mode, press the Stop/Reset button the specified number of time(s) according to the destination listed in the table below, and press the Power button.

Time(s)	LED indication	Destination
0 times	Green (Power)	Return to the menu selection
1 time	Orange (Alarm)	Japan
2 times	Green (Power)	KOR
3 times	Orange (Alarm)	USA / CANADA
4 times	Green (Power)	EUR
5 times	Orange (Alarm)	AUS
6 times	Green (Power)	ASA
7 times	Orange (Alarm)	CHN
8 times	Green (Power)	TWN
9 times or more	Orange (Alarm)	Return to the destination settings mode

Note: After setting the destination, be sure to initialize the EEPROM. The destination setting may not be valid unless the EEPROM is initialized after destination settings.

Confirm the model name in the service test print or EEPROM information print.
[See 3-4. Verification Items, (1) Service test print, or (2) EEPROM information print.]

<Button and LCD test procedures>

In the button and LCD test mode, perform the following to confirm the operation of the buttons and the LCD.

MP170:

1) Press the Stop/Reset button. The LCD color changes and displays a full black screen.
2) Press the Stop/Reset button again. "SCSPM-+OKBLRF" is displayed.
3) Each text displayed on the LCD is assigned to represent each button as follows (from left to right):

   Photo Index Sheet, COPY, SCAN, MEMORY CARD, Menu, -, +, OK, Back, Black, Color, Stop/Reset, ON/OFF

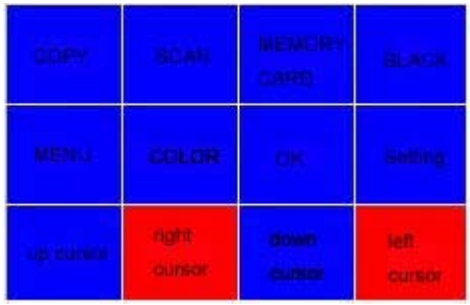
   Press each button, and confirm that the corresponding text on the LCD is disappeared.
4) When all the buttons are pressed and recognized properly, "PASS" is displayed on the LCD, and no further button operation is accepted.
5) Open the scanning unit. Only the Power button is enabled.
6) Press the Power button. The machine exits the test, and returns to the service mode menu selection.

MP450:

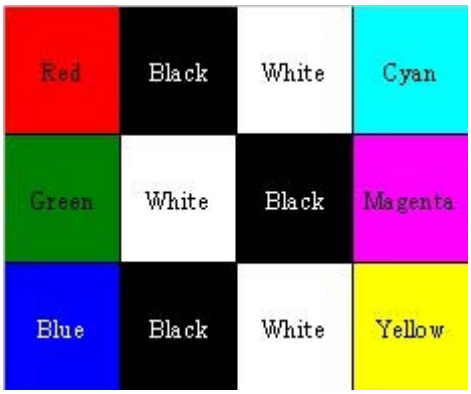
1) Press the Stop/Reset button. The LCD color changes and displays a full blue screen.
2) Press each button on the operation panel (except the Power and Stop/Reset buttons). The color of a portion corresponding to the pressed button changes to red.

   For each portion of the display and its corresponding button, see the diagram below. (The diagram is a sample when the right and left cursor buttons are pressed.)

   === LCD ===



3) When all the buttons excluding the Power and Stop/Reset buttons are pressed, the entire LCD changes to a full red screen.
4) Open the scanning unit to display the color pattern.



5) Press the Power button to return to the service mode menu selection.

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<Part 1: 3. REPAIR, 3-3 (5) to (7)>

3-4. Verification Items

(1) Service test print

<EEPROM information contents>

On the service test print (sample below), confirm the EEPROM information as shown below. (The information is given in the upper portion of the printout.)

MPxxxx JPN M=Vxxx C=Vxxx Dd=xxx.x Ds=xxx.x xx xx xx xx USB(xxxxxx)

MPxxx: Model name

JPN: Destination

M=Vxxx: ROM version

Dd=xxx.x: Main waste ink amount (%)

Ds=xxx.x: Platen waste ink amount (%)

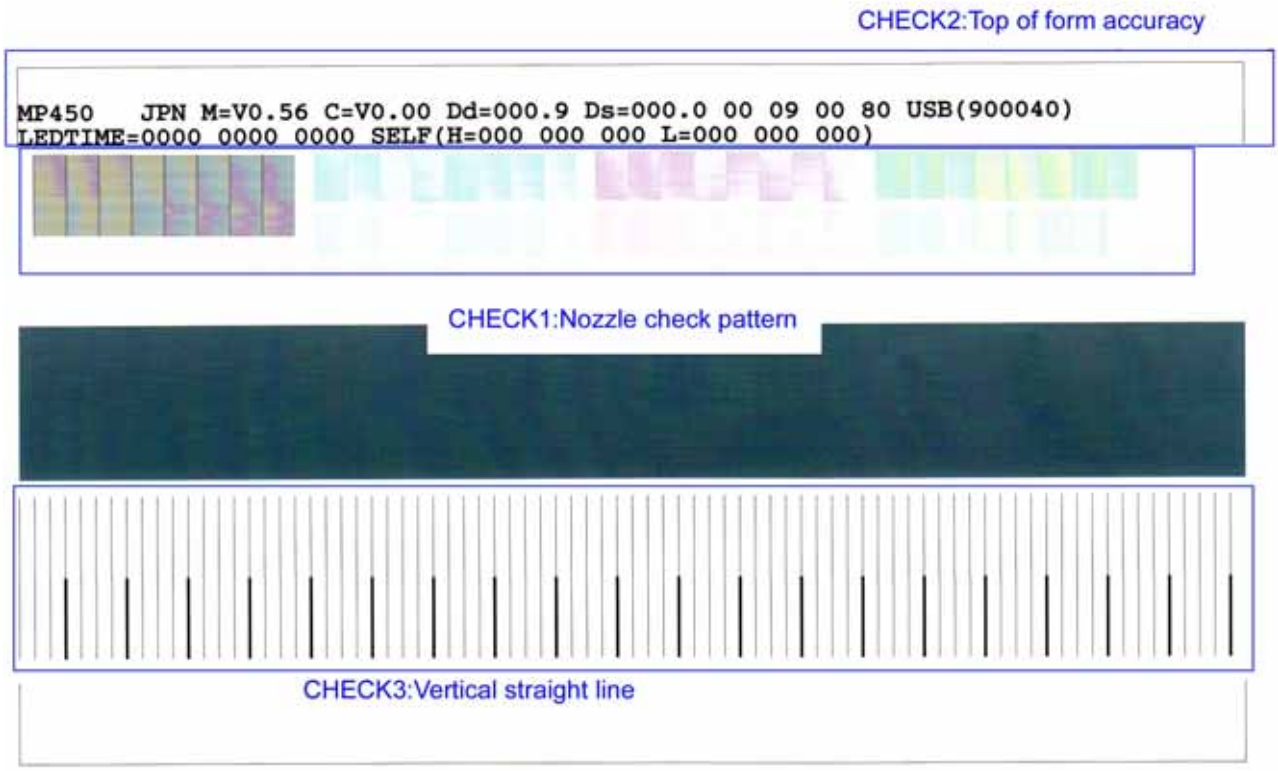
xx xx xx xx: USB serial number

<Print check items>

On the service test print (sample below), confirm the following items:

- Check 1, nozzle check pattern: Ink shall be ejected from all nozzles
- Check 2, top of form accuracy: The line shall not extend off the paper.
- Check 3, vertical straight lines: The line shall not be broken.

<Service test print sample>


CHECK2:Top of form accuracy
MP450 JPN M=V0.56 C=V0.00 Dd=000.9 Ds=000.0 00 09 00 80 USB(900040)
LEDTIME=0000 0000 0000 SELF(H=000 000 000 L=000 000 000)
CHECK1:Nozzle check pattern
CHECK3:Vertical straight line

(2) EEPROM information print

<How to read the EEPROM information print>

Print sample:

1: MPXXX JPN 2: V1.00 3: IF(USB1=1) 4: D=004.5 Ds=0.002 5: ST=2005/05/27-18:30
6: ER(ER0=1000 ER1=5100) 7: LPT=2004/06/03-09:09
8: PC(M=002 R=000 T=001 D=009 C=009)
9: CLT(2005/06/19-18:30)
10: CT(BK_ST=002 BK_HC=001 CL_ST=000 CL_HC=002) 11: IS(BK1=0 M=0 C=0 Y=0)
12: IC(BK1=01011 M=00436 C=00436 Y=00431) 13: P_ON(S=00002) 14: M_REG=0
15: UR(A(CLsi)=000 B(BKoe)=000 C(BKsi)=000 D(BKbi)=00 E(kKClx)=000 F(BkCly)=000
G(Cbi)=000 H(SCbi)=000 I(C-SC)=000)

16: WP-0021 17: CDIN(LG-000 PB=000 OPB=000) 18: BTIN=0 19: MSD(000)
20: TPAGE=00001 (TTL=00001 COPY=00000)
21: PAGE(All=00001 PP=00001 HR+MP=00000 PR+SP+SG=00000 GP=00000 PC=00000 EV=00000)
22: CDPAGE(All=00000) 23: EDGE=00000 24: L=00000 25: BTPAGE=0000
<Direct>
26: LG=01 Japanese 27: SC=000 28: PrnB=000 29: Seal=000 30: CDI=000 31: CDP=000
32: CDD-PR(L=0002 2L=0000 PC=0000 A4=0000) 33: CDD-SP(L=0002 2L=0000 PC=0000 A4=0000)
34: CDD-MP(L=0002 2L=0000 PC=0000 A4=0000) 35: DCD-PR(L=0002 2L=0000 PC=0000 A4=0000)
36: DCD-FPP(L=0002 2L=0000 PC=0000 A4=0000) 37: DCD-MPP(L=0002 2L=0000 PC=0000 A4=0000)
<Scanner>
38: SC=00000
39: SC-dpi (75-00000 150=00000 300=00000 600=00000 1200=00000 2400=00000)
40: SG (GY=00000 CL=00000)
<Copy>
41: MCASF(PP=00000 SP+ PR+GP=00000 OTH=00000)
42: CCASF(PP=00000 HR+MP=00000 PR+SP+SG=00000 GP=00000 PC=00000
43: Head TempBK=43.0 Head TempC=33.0 44: Env Temp=27.5 45: FF(80 00 09)
<Scan error history>
46: 000 0000

Printed items:

1. Model name 2. ROM Version 3. Connected I/F (USB1) 4. Waste ink amount (D = Main, Ds = Platen) 5. Installation date

6. Operator call/service call error record 7. Last printing time

8. Purging count

9. Cleaning time 10. Ink cartridge replacement count (standard BK, high-capacity BK, standard CL, high-capacity CL)

11. Ink status (BK/M/C/Y) 12. Ink consumption (BK/M/C/Y) 13. Power-on count (soft-on)

14. Manual print head alignment by user 15. User print head alignment value

16. Wiping count 17. Camera Direct Print-supported device connection record (Bubble Jet Direct, Canon PictBridge, Other maker's PictBridge)

18. Bluetooth-supported device connection record 19. Longest period of non-printing

20. Total pages fed 21. Pages fed (total, plain paper, High Resolution Paper & Matte Photo Paper, Photo Paper Pro & Photo Paper Plus Glossy & Photo Paper Plus Semi-gloss, Glossy Photo Paper, Postcard, Envelope)

22. Camera Direct print pages (total) 23. Borderless print pages 24. L & 4x6 print pages 25. Print pages via Bluetooth connection

<Direct>

26. Language destination 27. Business card & Credit card size paper print pages 28. Print Beam print pages 29. Photo Stickers print pages 30. Memory card use count

31. Total Card Direct Printing print pages 32. Number of Card Direct print: Photo Paper Pro (L/4x6, 2L/5x7, Japanese postcard, and A4/Letter)

33. Number of Card Direct print: Photo Paper Plus Glossy (L/4x6, 2L/5x7, Japanese postcard, and A4/Letter)

34. Number of Card Direct print: Matte Photo Paper (L/4x6, 2L/5x7, Japanese postcard, and A4/Letter)

35. Number of Camera Direct print: Photo Paper (L/4x6, 2L/5x7, Japanese postcard, and A4/Letter)

36. Number of Camera Direct print: Fast Photo Paper (L/4x6, 2L/5x7, Japanese postcard, and A4/Letter)

37. Number of Camera Direct print: Matte Photo Paper (L/4x6, 2L/5x7, Japanese postcard, and A4/Letter)

<Scanner>

38. Total scan count

39. Scan count by scanning resolution (75, 150, 300, 600, 1200, 2400 dpi)

40. Scan count by scanning gradation (grayscale, color)

<Copy>

41. Monochrome copy pages fed (plain paper, Photo Paper Pro & Photo Paper Plus Glossy & Photo Paper Plus Semi-gloss & Glossy Photo Paper, other)

42. Color copy pages fed (plain paper, High Resolution Paper & Matte Photo Paper, Photo Paper Pro & Photo Paper Plus Glossy & Photo Paper Plus Semi-gloss, Glossy Photo Paper, postcard)

43. Print head temperature 44. Inside temperature 45. Line inspection information

<Scan error history>

46. Scanner error history

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<Part 1: 3. REPAIR, 3-4>

Part 2

TECHNICAL REFERENCE

1. NEW TECHNOLOGIES

(1) Paper thickness lever (at the bottom front of the machine)

The head-to-paper distance can be adjusted using the paper thickness lever.

<Possible problems with this function>

1) The ink cartridge rubs against the paper when the amount of paper curl is large.

   => Flatten curled paper (to less than 3 mm).

   => In print modes other than borderless printing, conduct printing in the print quality assurance area of the top and bottom edges. (Top margin 38.3 mm, bottom margin 31.2 mm)

(2) Quiet mode

The machine has a quiet mode function.

Compared with the normal mode,

- Acoustic noise level: slightly lower. (HQ normal approx. 45 dB, Quiet approx. 43.0 dB)
- Audible overtone level: Sound quality changes, and sound becomes quieter.
- Print speed: Slows.

<Possible problems with this function>

1) The operation sound does not become quieter.

   => The audible sound becomes only slightly quieter.

2) Printing is slow.

   => Disable the Quiet mode.

(3) Remaining ink level detection function

The machine has a function to detect the remaining ink level.

<Detection method>

- Dot counting (counted for each BK / CL ink cartridge)
- For the CL cartridge, the remaining ink level is detected by total counted dot values of 3 colors of ink.

<Display method>

- Displayed on the Status Monitor (at 4 levels listed below for each BK / CL ink cartridge)

  Level 1: Approx. 70% of ink remaining

  Level 2: Approx. 40% of ink remaining

  Level 3: Indication of "!" mark (Remaining ink level is low)

  Level 4: Indication of "X" mark (No ink remaining)

Note: Remaining ink detection function displays the status only, and does not cause errors.

<Accuracy>

- The margin of error of detection accuracy is +/-10% in normal printing.
- The margin of error is likely to be large in the following specific print patterns:

  i) When printing continuously using any one of the CMY colors of ink (CL ink detection error margin):

  As the remaining ink level is calculated by the counted dot value of the least remaining ink of 3 colors,

if any of the C/M/Y inks is heavily consumed, the margin of error for remaining ink increases.

ii) When performing continuous BK solid printing (BK ink detection error margin):

With continuous printing, ink flow from the tank to the ink chamber can be interrupted, after which ink remains unused in the tank.

<Possible problems with this function>

1) When a one-used ink cartridge is installed, the actual remaining ink level is not detected, and an error indicating the remaining ink amount is unknown occurs.

=> Pressing the OK button will clear the error, and printing can be done. However, the function to detect the remaining ink amount is disabled (ink status i not displayed).

e.g. An ink cartridge was once used in another machine.

A current ink cartridge is removed from the machine. -> A new ink cartridge is installed. -> The removed ink cartridge is installed again after removing the new ink cartridge.

2) Due to the specific print pattern, the actual remaining ink level does not match the indicated remaining ink level.

- This is because a detection error can be large in specific print patterns (such as continuous printing using any one of the CMY colors of ink or continuous solid printing, etc.). (See "Accuracy" above.)

(4) Print head alignment

The machine has a print head alignment function to correct displacements between the nozzle lines of the print head, and incorrect print position in bi-directional printing. As it is not necessary to perform print head alignment at setup or installation of the machine, the function is only briefly introduced at installation.

2 types of print head alignment, the manual alignment using the MP driver and the automatic alignment using the print head alignment sheet, are available.

<Print head alignment>

A: Alignment of cyan nozzle inclination

B: Alignment of cyan large nozzles in bi-directional printing

C: Alignment of cyan small nozzles in bi-directional printing

D: Alignment between cyan large and small nozzles

E: Alignment o magenta large nozzles in bi-directional printing

F: Alignment of magenta small nozzles in bi-directional printing

G: Alignment between magenta large and small nozzles

H: Alignment between black even and odd nozzles

I: Alignment of black nozzle inclination

J: Alignment of black nozzles in bi-directional printing

K: Horizontal alignment between CL and BK chips

L: Vertical alignment between CL and BK chips

M: Alignment of yellow large nozzles in bi-directional printing

N: Alignment of yellow small nozzles in bi-directional printing

O: Alignment between yellow large and small nozzles

<Problems that can be resolved by this function>

Try the print head alignment for the following problems:

- The line is not straight.

- Printout is granulated.

<Possible problems with this function>

1) Failure in scanning the print head alignment

- If all the applicable boxes are not filled in, or if the sheet is not placed properly on the platen glass, the error occurs.

=> Press the OK button to clear the error, and start the alignment procedures from printing of the print head alignment sheet. If scanning of the alignment sheet is tried without re-printing the sheet, the same error occurs.

(5) Print Beam printing (MP450 only)

Wireless printing of photos from a camera-equipped mobile phone via infrared or Bluetooth communication is available.

(Wireless printing from a computer or PDA is not available. Text cannot be wirelessly printed.

For Bluetooth communication, use the optional BU-20.)

<Supported mobile phones>

- Mobile phones with the IrDA port, supporting image data transfer via infrared communication

<Printable data>

- Photos taken with a camera-equipped mobile phone

<Restrictions>

- An image of 4.5 M or larger cannot be printed in some instances. Therefore, depending on a mobile phone model, an image at the maximum resolution may not be printed.
- A moving image is not printed.
- Depending on a mobile phone model, data saved in its memory card is not printed.
- Downloaded contents or photos downloaded from a URL attached to a mail may not be printed.

<Possible problems with this function>

1) Print image quality is rough.

- The image resolution is automatically determined by the image size at shooting, thus printing on a large size paper may result rough print quality.

=> Print on a small size paper, such as Business Card size, Credit Card size, or Photo Stickers.

2) Print orientation (portrait / landscape) cannot be specified.

- The print orientation is automatically determined by the image size at shooting.

=> Take a photo again in a desired orientation (portrait or landscape).

3) In borderless printing, the left and right side portions or the top and bottom portions extend off the paper.

- This is because the aspect ratio of a photo taken by a mobile-phone differs from that of paper.

=> Take a photo again, adjusting to position a shooting object in the center of the frame.

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<Part 2: 1. NEW TECHNOLOGIES>

2. CLEANING MODE AND AMOUNT OF INK PURGED

To prevent printing problems due to bubbles, dust, or ink clogging, print head cleaning is performed before the start of printing, except in the following cases:

- Cleaning on arrival: Performed when the access cover is closed.
- Cleaning by dot count: Performed after ejection of paper (or after printing on the back side of paper when auto duplex printing is performed).
- Manual cleaning / deep cleaning: Performed manually.

<Cleaning mode list>

Condition	Details	Amount of ink used (g)	Est. required time (sec.)
Dot count cleaning	When the specified number of dots are printed since the previous cleaning.	BK: 0.10 CL: 0.10	40
Timer cleaning - 0 (First to third cleaning after shipping from the plant.)	If 24 to 336 hours have elapsed since the previous cleaning till the start of the next printing.	BK: 0.10 CL: 0.10	40
Timer cleaning - 1	If 336 to 1,440 hours have elapsed since the previous cleaning till the start of the next printing.	BK: 0.10 CL: 0.10	40
Timer cleaning - 2	If 1,440 to 2,160 hours have elapsed since the previous cleaning till the start of the next printing.	BK: 0.15 CL: 0.15	42
Timer cleaning - 3	If 2,160 to 4,320 hours have elapsed since the previous cleaning till the start of the next printing.	BK: 0.30 CL: 0.30	53
Timer cleaning - 4	If more than 4,320 hours have elapsed since the previous cleaning till the start of the next printing.	BK: 0.45 CL: 0.45	55
If the print head has not been capped before power-on		BK: 0.15 CL: 0.15	42
At CL ink cartridge replaceme-1	Till 5,760 hours after the production date.	BK: 0.10 CL: 0.10	40
At CL ink cartridge replaceme-2	If more than 5,760 hours have elapsed since the production date.	BK: 0.24 CL: 0.24	55
At BK ink cartridge replacement-1	Till 5,760 hours after the production date.	BK: 0.19 CL: 0.19	45
At BK ink cartridge replacement-2	If more than 5,760 hours have elapsed since the production date.	BK: 0.30 CL: 0.30	53
On arrival of the machine		BK: 0.30 CL: 0.30	53
Manual cleaning	- Via the operation panel - Via the MP driver	BK: 0.10 CL: 0.10	40
Deep cleaning	- Via the operation panel - Via the MP driver	BK: 0.45 CL: 0.45	55

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<Part 2: 2. CLEANING MODE AND AMOUNT OF INK PURGED>

3. PRINT MODE

White background: Print with 5 pl only
Yellow background: Print with 5 pl and 2 pl
Green text: Fast
Blue text: Standard
Red text: High

3-1. Resolution in Printing via Computer (Print on One or Both Sides of Paper, BK Cartridge, Monochrome Mode)

Paper type		Quality level 5	Quality level 4	Quality level 3	Quality level 2	Quality level 1
Plain paper	No. of passes Resolution (dpi)	1 pass Bk: 300x300	1 pass Bk: 300x300	1 pass Bk: 600x600	4 pass Bk: 600x600	

3-2. Resolution in Printing via Computer (Print on One or Both Sides of Paper, BK and CL Cartridges, Monochrome Mode)

Paper type		Quality level 5	Quality level 4	Quality level 3	Quality level 2	Quality level 1
Plain paper	No. of passes Resolution (dpi)	1 pass Bk: 300x300	1 pass Bk: 300x300	1 pass Bk: 600x600	4 passes Bk: 600x600	
High Resolution Paper HR-101S	No. of passes Resolution (dpi)			4 passes Bk: 600x600 (print on one side)	4 passes Bk: 600x600 (print on one side)	
Photo Paper Pro PR-101	No. of passes Resolution (dpi)			6 passes Y, M, C: 600x 600 (print on one side)	12 passes Y, M, C: 600x 600 (print on one side)	16 passes Y, M, C: 1,200x 1,200 (print on one side)
Glossy Photo Paper GP-401	No. of passes Resolution (dpi)			6 passes Y, M, C: 600x 600 (print on one side)	12 passes Y, M, C: 600x 600 (print on one side)	
Photo Paper Plus Glossy Photo Paper Plus Semi-gloss PP-101/SG-101	No. of passes Resolution (dpi)		4 passes Y, M, C: 600x 600 (print on one side)	6 passes Y, M, C: 600x 600 (print on one side)	12 passes Y, M, C: 600x 600 (print on one side)	
Matte Photo Paper	No. of passes Resolution			6 passes Y, M, C: 600x 600	12 passes Y, M, C: 600x 600	

MP-101	(dpi)			(print on one side)	(print on one side)	
Envelope	No. of passes Resolution (dpi)		1 pass Bk: 600x600 (print on one side)	4 passes Bk: 600×600 (print on one side)	4 passes Bk: 600×600 (print on one side)	
T-shirt transfer TR-301	No. of passes Resolution (dpi)			6 passes Y, M, C: 600×600 (print on one side)		
Transparency CF-102	No. of passes Resolution (dpi)			2 passes Bk: 600×600 Y, M, C: 600×600 (print on one side)	6 passes Bk: 600×600 Y, M, C: 600×600 (print on one side)	
Photo Paper Plus Double Sided PP-101D	No. of passes Resolution (dpi)			6 passes Y, M, C: 600×600	12 passes Y, M, C: 600×600	
Other Photo Paper	No. of passes Resolution (dpi)				12 passes Y, M, C: 600×600 (print on one side)	

3-3. Resolution in Printing via Computer (Print on One or Both Sides of Paper, BK and CL Cartridges, Color Mode)

Paper type		Quality level 5	Quality level 4	Quality level 3	Quality level 2	Quality level 1
Plain paper	No. of passes Resolution (dpi)	1 pass Bk: 300×300 Y, M, C: 300×300	1 pass Bk: 300×300 Y, M, C: 300×300	Bk: 1 pass Y, M, C: 2 passes Bk: 600×600 Y, M, C: 600×600	6 passes Bk: 600×600 Y, M, C: 600×600	
High Resolution Paper HR-101S	No. of passes Resolution (dpi)			6 passes Y, M, C: 600×600 (print on one side)	12 passes Y, M, C: 600×600 (print on one side)	
Photo Paper Pro PR-101	No. of passes Resolution (dpi)			6 passes Y, M, C: 600×600 (print on one side)	12 passes Y, M, C: 600×600 (print on one side)	16 passes Y, M, C: 1,200×1,200 (print on one side)
Glossy Photo	No. of passes			6 passes Y, M, C: 600×	12 passes Y, M, C: 600×	

Paper GP-401	Resolution (dpi)			600 (print on one side)	600 (print on one side)	
Photo Paper Plus Glossy Photo Paper Plus Semi-gloss PP-101/SG-101	No. of passes Resolution (dpi)		4 passes Y, M, C: 600x 600 (print on one side)	6 passes Y, M, C: 600x 600 (print on one side)	12 passes Y, M, C: 600x 600 (print on one side)	
Matte Photo Paper MP-101	No. of passes Resolution (dpi)			6 passes Y, M, C: 600x 600 (print on one side)	12 passes Y, M, C: 600x 600 (print on one side)	
Envelope	No. of passes Resolution (dpi)		2 passes Bk: 600x600 Y, M, C: 600x 600 (print on one side)	4 passes Bk: 600x600 Y, M, C: 600x 600 (print on one side)	6 passes Bk: 600x600 Y, M, C: 600x 600 (print on one side)	
T-shirt transfer TR-301	No. of passes Resolution (dpi)			6 passes Y, M, C: 600x 600 (print on one side)		
Transparency CF-102	No. of passes Resolution (dpi)			2 passes Bk: 600x600 Y, M, C: 600x 600 (print on one side)	6 passes Bk: 600x600 Y, M, C: 600x 600 (print on one side)	
Photo Paper Plus Double Sided PP-101D	No. of passes Resolution (dpi)			6 passes Y, M, C: 600x 600	12 passes Y, M, C: 600x 600	
Other Photo Paper	No. of passes Resolution (dpi)				12 passes Y, M, C: 600x 600 (print on one side)	

3-4. Resolution in Printing via Computer (Print on One or Both Sides of Paper, CL Cartridge, Color or Monochrome Mode)

Paper type		Quality level 5	Quality level 4	Quality level 3	Quality level 2	Quality level 1
Plain paper	No. of passes Resolution (dpi)	1 pass Y, M, C: 300x 300	1 pass Y, M, C: 300x 300	2 passes Y, M, C: 600x 600	6 passes Y, M, C: 600x 600	

High Resolution Paper HR-101S	No. of passes Resolution (dpi)			6 passes Y, M, C: 600× 600 (print on one side)	12 passes Y, M, C: 600× 600 (print on one side)	
Photo Paper Pro PR-101	No. of passes Resolution (dpi)			6 passes Y, M, C: 600× 600 (print on one side)	12 passes Y, M, C: 600× 600 (print on one side)	16 passes Y, M, C: 1,200× 1,200 (print on one side)
Glossy Photo Paper GP-401	No. of passes Resolution (dpi)			6 passes Y, M, C: 600× 600 (print on one side)	12 passes Y, M, C: 600× 600 (print on one side)	
Photo Paper Plus Glossy Photo Paper Plus Semi-gloss PP-101/SG-101	No. of passes Resolution (dpi)		4 passes Y, M, C: 600× 600 (print on one side)	6 passes Y, M, C: 600× 600 (print on one side)	12 passes Y, M, C: 600× 600 (print on one side)	
Matte Photo Paper MP-101	No. of passes Resolution (dpi)			6 passes Y, M, C: 600× 600 (print on one side)	12 passes Y, M, C: 600× 600 (print on one side)	
Envelope	No. of passes Resolution (dpi)		2 passes Y, M, C: 600× 600 (print on one side)	4 passes Y, M, C: 600× 600 (print on one side)	6 passes Y, M, C: 600× 600 (print on one side)	
T-shirt transfer TR-301	No. of passes Resolution (dpi)			6 passes Y, M, C: 600× 600 (print on one side)		
Transparency CF-102	No. of passes Resolution (dpi)			2 passes Y, M, C: 600× 600 (print on one side)	8パス Y, M, C: 600× 600 (print on one side)	
Photo Paper Plus Double Sided PP-101D	No. of passes Resolution (dpi)			6 passes Y, M, C: 600× 600	12 passes Y, M, C: 600× 600	
Other Photo Paper	No. of passes Resolution (dpi)				12 passes Y, M, C: 600× 600 (print on one side)	

3-5. Resolution in Borderless Printing (Print on One or Both Sides of Paper, BK and CL Cartridges or CL Cartridge Only, Color or Monochrome Mode)

Paper type		Quality level 5	Quality level 4	Quality level 3	Quality level 2	Quality level 1
Plain paper	No. of passes Resolution (dpi)	1 pass Y, M, C: 300×300	1 pass Y, M, C: 300×300	2 passes Y, M, C: 600×600	6 passes Y, M, C: 600×600	
High Resolution Paper HR-101S	No. of passes Resolution (dpi)			6 passes Y, M, C: 600×600 (print on one side)	12 passes Y, M, C: 600×600 (print on one side)	
Photo Paper Pro PR-101	No. of passes Resolution (dpi)			6 passes Y, M, C: 600×600 (print on one side)	12 passes Y, M, C: 600×600 (print on one side)	16 passes Y, M, C: 1,200×1,200 (print on one side)
Glossy Photo Paper GP-401	No. of passes Resolution (dpi)			6 passes Y, M, C: 600×600 (print on one side)	12 passes Y, M, C: 600×600 (print on one side)	
Photo Paper Plus Glossy Photo Paper Plus Semi-gloss PP-101/SG-101	No. of passes Resolution (dpi)		4 passes Y, M, C: 600×600 (print on one side)	6 passes Y, M, C: 600×600 (print on one side)	12 passes Y, M, C: 600×600 (print on one side)	
Matte Photo Paper MP-101	No. of passes Resolution (dpi)			6 passes Y, M, C: 600×600 (print on one side)	12 passes Y, M, C: 600×600 (print on one side)	
Envelope	No. of passes Resolution (dpi)		2 passes Y, M, C: 600×600 (print on one side)	4 passes Y, M, C: 600×600 (print on one side)	6 passes Y, M, C: 600×600 (print on one side)	
T-shirt transfer TR-301	No. of passes Resolution (dpi)			6 passes Y, M, C: 600×600 (print on one side)		
Transparency CF-102	No. of passes Resolution (dpi)			2 passes Y, M, C: 600×600 (print on one side)	8パス Y, M, C: 600×600 (print on one side)	
Photo Paper Plus Double Sided	No. of passes Resolution			6 passes Y, M, C: 600×600	12 passes Y, M, C: 600×600	

PP-101D	(dpi)					
Other Photo Paper	No. of passes Resolution (dpi)				12 passes Y, M, C: 600x 600 (print on one side)	

3-6. Resolution in Direct Printing

Paper type		Standard	High
Plain paper	No. of passes Resolution (dpi)	4 passes Bk: 600x600 Y, M, C: 600x600 (with borders only)	6 passes Bk: 600x600 Y, M, C: 600x600 (with borders only)
Photo Paper Pro PR-101	No. of passes Resolution (dpi)	6 passes Y, M, C: 600x600	12 passes Y, M, C: 600x600
Glossy Photo Paper GP-401	No. of passes Resolution (dpi)	6 passes Y, M, C: 600x600	12 passes Y, M, C: 600x600
Photo Paper Plus Glossy Photo Paper Plus Semi-gloss PP-101/SG-101	No. of passes Resolution (dpi)	6 passes Y, M, C: 600x600	12 passes Y, M, C: 600x600
Matte Photo Paper MP-101	No. of passes Resolution (dpi)	6 passes Y, M, C: 600x600	12 passes Y, M, C: 600x600

3-7. Resolution in Copying (Copy on One or Both Sides of Paper, Color or Monochrome Mode)

Paper type		Quality level 5	Quality level 4	Quality level 3	Quality level 2	Quality level 1
Plain paper Print on one side of paper Monochrome mode	No. of passes Resolution (dpi)	1 pass Bk: 300x300 (with borders only)		1 pass Bk: 600x600 (with borders only)	4 passes Bk: 600x600 (with borders only)	
Plain paper Print on one side of paper Color mode	No. of passes Resolution (dpi)	1 pass Bk: 300x300 Y, M, C: 300x 300 (with borders only)		Bk: 1 pass Y, M, C: 2 passes Bk: 600x600 Y, M, C: 600x 600 (with borders only)	6 passes Bk: 600x600 Y, M, C: 600x 600 (with borders only)	
Plain paper Print on both sides of paper	No. of passes Resolution (dpi)	1 pass Bk: 300x300 Y, M, C: 300x 300 (with borders only)		Bk: 1 pass Y, M, C: 2 passes Bk: 600x600 Y, M, C: 600x 600 (with borders only)	6 passes Bk: 600x600 Y, M, C: 600x 600 (with borders only)	
Photo Paper Pro PR-101	No. of passes Resolution (dpi)			6 passes Y, M, C: 600x 600 (print on one side)	12 passes Y, M, C: 600x 600 (print on one side)	
Glossy Photo Paper GP-401	No. of passes Resolution (dpi)			6 passes Y, M, C: 600x 600 (print on one side)	12 passes Y, M, C: 600x 600 (print on one side)	
Photo Paper Plus Glossy Photo Paper Plus Semi-gloss PP-101/SG-101	No. of passes Resolution (dpi)			6 passes Y, M, C: 600x 600 (print on one side)	12 passes Y, M, C: 600x 600 (print on one side)	
Matte Photo Paper MP-101	No. of passes Resolution (dpi)			6 passes Y, M, C: 600x 600 (print on one side)	12 passes Y, M, C: 600x 600 (print on one side)	

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<Part 2: 3. PRINT MODE>

4. FAQ (Problems Specific to the MP170 / MP450 and Corrective Actions)

No.	*	Function	Phenomenon	Condition	Cause	Corrective action	Possible call or complaint
1	A	Installation	Carriage error (LED cyclic blinking in orange and green 2 times)	During unpacking and setup by a user	The user may not have removed the packing material fixing the carriage. Note: Even if the carriage packing material remains, no parts are damaged.	- Remove the packing material fixing the carriage. - Turn the machine off, and on again.	The LEDs blink alternately in orange and green, 2 times (carriage error).
2	A	Installation	Ink cartridge installation error (2 times of LED cyclic blinking in orange and green)	- During unpacking and setup by a user - At ink cartridge replacement	The user did not install the ink cartridges completely.	Open the scanning unit, and install the ink cartridge(s) properly.	An error occurs indicating incomplete installation of an ink cartridge.
3	B	Installation	Memory card not accessed or removed	In using a memory card which needs to be used with the card adapter	The user inserted the memory card into the slot without using the card adapter.	- Use the card adapter to insert the memory card into the slot. - If the card cannot be removed, servicing is required.	- Printing cannot be done. - The memory card is not recognized.
4	B	Paper feeding	No paper feeding		The paper feed roller slips on the paper at paper feeding.	- Perform roller cleaning from the MP driver. - Clean the paper feed roller with pre-moistened wipe or moistened cloth.	- Paper out error - Paper cannot be fed - Cannot print
5	C	Paper feeding	Multi-feeding	In the high temperature and high humidity environment	The frictional force between the front and back sides of paper becomes high, and sheets stick to each other, contributing to multi-feeding.	- Fan the paper and set them in the ASF. - In case of PR-101, set the paper sheet by sheet in the ASF.	- Multiple sheets of paper feed. - Blank paper is ejected.
6	B	Paper feeding	Envelope not feeding	Envelopes	The paper feed roller slips on the paper at paper feeding. Note: Depending on the paper lots.	- Perform roller cleaning from the MP driver. - Clean the paper feed roller with pre-moistened wipe or moistened cloth. - Reduce the number of envelopes set in the ASF. - Flatten the	- Paper out error - Paper cannot be fed - Cannot print

						envelope (with a pen).	
7	B	Paper feeding	Paper jam, or improper paper ejection	Credit Card size paper	Due to paper setting in the ASF with the longer side down, the LF roller cannot catch the paper, preventing paper feeding.	- Open the scanning unit, and remove the jammed paper. - Set a sheet of Credit Card size paper in the ASF with the shorter side down, and press the Stop/Reset button.	- Paper jam error - Paper cannot be fed - Cannot print
8	B	Image quality	Smearing on printed side		The edge of paper rises due when paper is curled, causing the ink cartridge to rub against the printed surface of paper.	- Correct the paper curl. - Set the paper thickness lever for thick paper. - Recommend the user to print in the print quality assurance area.	- Smear on the printed side of paper - Cannot print properly - Paper edge crease
9	B	Image quality	Smearing on the backside, or address side of postcards		When borderless printing is conducted continuously, ink mist attaches to the ribs on the platen, and is transferred to the backside of the following paper.	- Perform Bottom plate cleaning[*1] from the MP driver. - Clean the ribs on the platen with cotton swabs / buds[*2].	<Photo Paper Plus Double Sided> - Smears on the already printed side when printing the other side <When printing the address side of postcards> - Smears on the address side <When printing the message side of postcards> - Smears on the backside
10	C	Image quality	Horizontal lines or uneven print density at the trailing edge of paper		When the paper end comes off the pinch roller, printing is performed without the paper being held, preventing the ink drops from being ejected in the correct positions, resulting in unevenness. Note: The problems is less noticeable than that of the MP110 / MP130.	- Recommend printing in the print quality assurance area. - Change the print quality from Standard to High mode. - Try other paper (PP-101).	- Cannot print to the bottom edge of paper - Line or uneven print density appear in the trailing edge of paper - Cannot print properly

11	C	Image quality	Horizontal lines or uneven print density due to LF roller feeding at small pitch		As the print media slightly slips while being fed by the LF roller, printed areas overlap, causing the problem.	- Perform print head alignment. - Change the print quality from Standard to High mode.	- Lines or uneven print density (on skin tones and background) - Cannot print properly
12	C	Installation	Print head alignment error	During automatic print head alignment using the alignment sheet	- All the applicable boxes of the alignment sheet are not filled in. - The alignment sheet is not placed on the platen glass properly.	- Press the OK button to clear the error. - Then, start from printing of the print head alignment sheet again. Note: Re-scanning without re-printing the alignment sheet does not function properly.	- Print head alignment error

*1: When paper is not soiled, cleaning is complete. Change paper each time cleaning is performed.

*2: Locations to clean in servicing when soiling on paper in automatic duplex printing persists:

* Occurrence level:

A: The symptom is likely to occur frequently. (Caution required)

B: The symptom may occur under certain conditions, but likeliness is assumed very low in practical usage.

C: The symptom is unlikely to be recognized by the user, and no practical issues are assumed.

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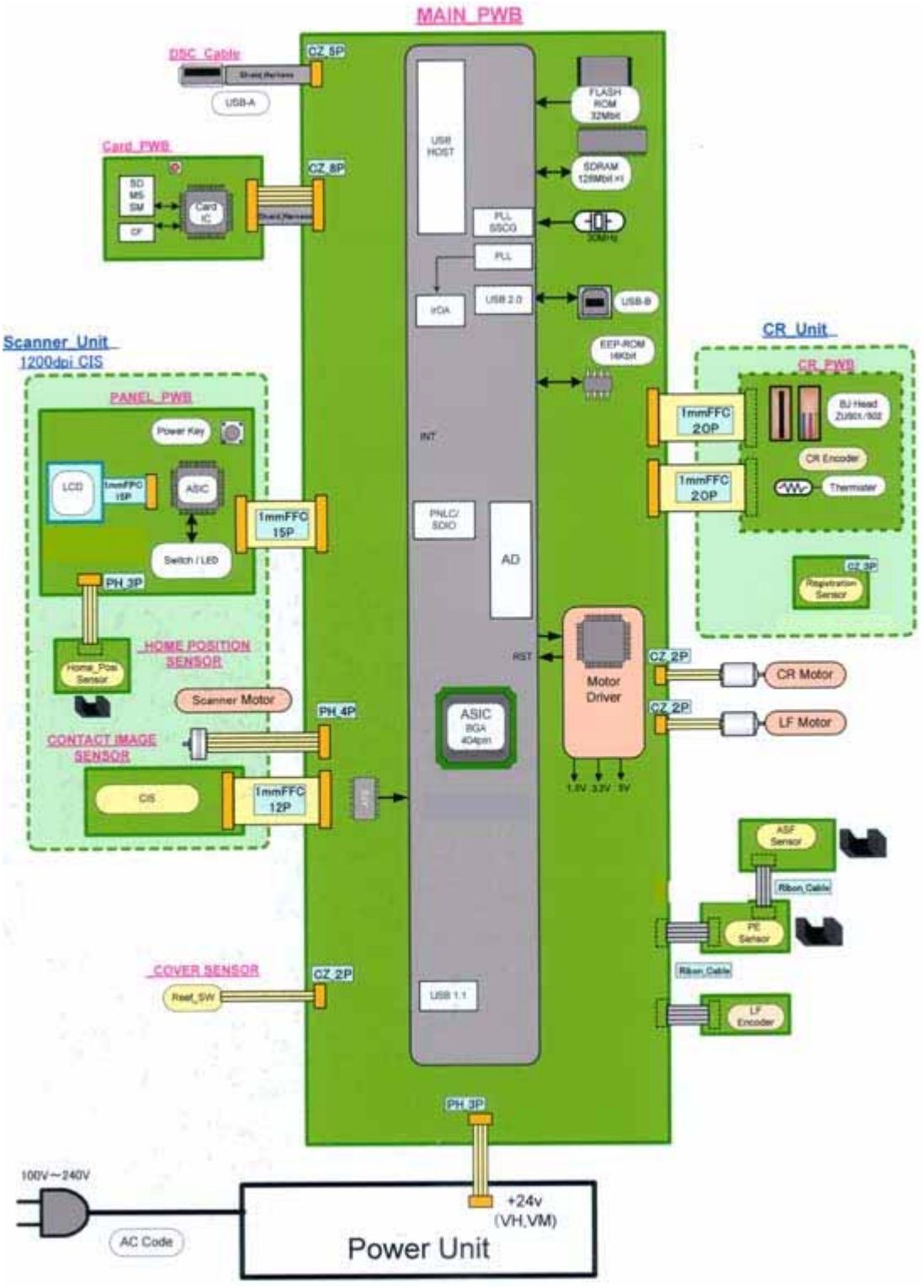
<Part 2: 4. FAQ>

Part 3

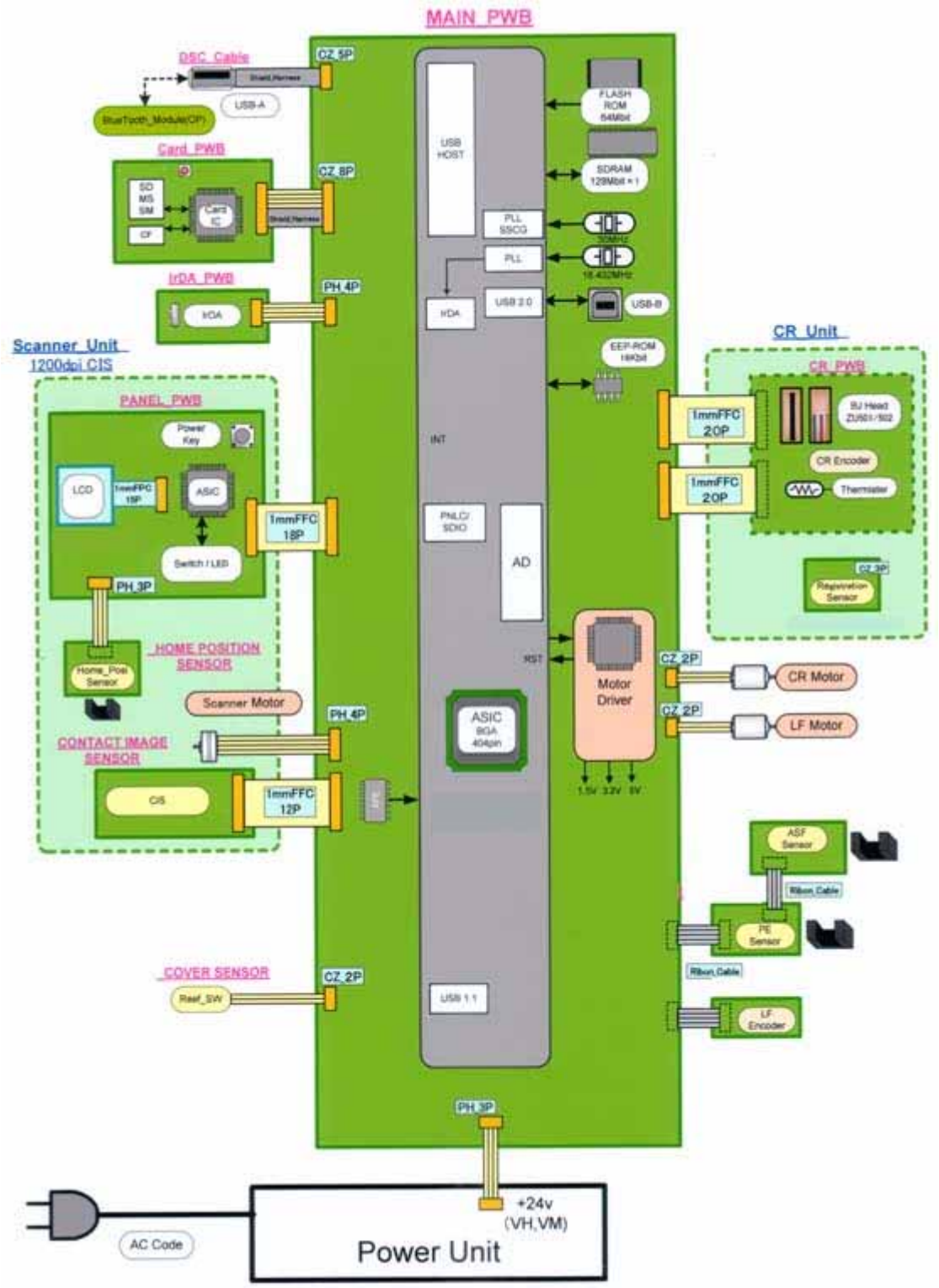
APPENDIX

1. BLOCK DIAGRAM

MP170:



MP450:



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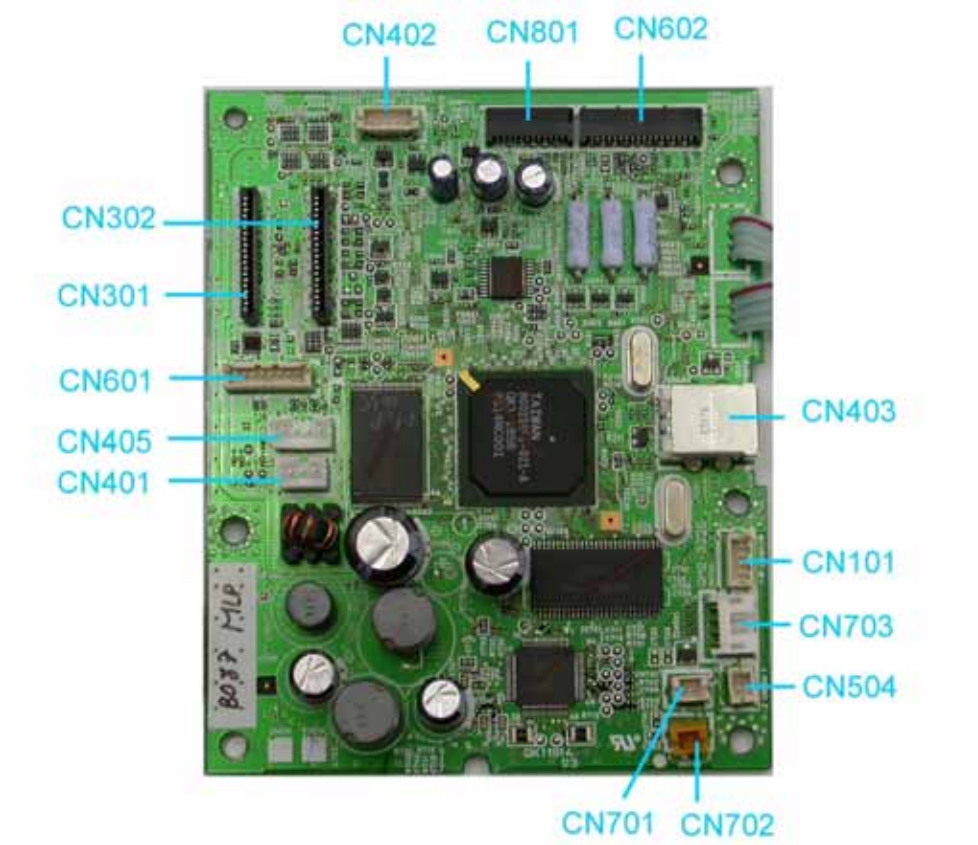
<Part 3: 1. BLOCK DIAGRAM>

2. CONNECTOR LOCATION AND PIN LAYOUT

2-1. Main Board



CN101 (Remote debugger)

No.	Signal name	Function
1	TXD	Transmit data signal
2	RXD	Receive data signal
3	GND	Ground
4	+3.3V	Power supply

CN301 (Print head 1/2 [Carriage unit])

No.	Signal name	Function
1 to 3, 14 to 16	VHGND	Head drive ground
4 to 8	VH	Head drive 24V
9	DIA	Diode sensor anode side
10	B_CNO	Head contact detection signal (BK)
11	DATA (C)	Cyan seiral data
12	DATA (M)	Magenta serial data
13	DATA (Y)	Yellow serial data
17	SGND	Ground
18	B_HE2	Heat enable
19	Not used	Not used
20	Not used	Not used

CN302 (Print head 2/2 [Carriage unit])

No.	Signal name	Function
1	DIA	Diode sensor anode side
2, 5, 8, 10, 12, 14	SGND	Ground
3	A_HE0	Heat enable
4	A_CNO	Head contact detection signal (CL)
6	DATA_EVEN	Even nozzle data
7	DATA_ODD	Odd nozzle data
9	HCLK	Head clock
11	ID2	Head ID
13	TH	Thermistor signal
15	ENC_OUT1	Encoder signal
16	ENC_OUT0	Encoder signal
17	ENC_PWR	Encoder 3.3V
18	HVDD	Head logic power upply
19	HLAT	Latch signal
20	B_HE1	Heat enable

CN401 (Power supply)

No.	Signal name	Function
1	VM	24V power supply output
2	PW_CONT	Power control signal
3	GND	Ground

CN402 (PictBridge)

No.	Signal name	Function
1	F-GND	Frame ground
2	S-GND	Signal ground
3	D+	D+ signal
4	D-	D- signal
5	VBUS	VBUS signal

CN403 (USB 2.0)

No.	Signal name	Function
1	SNS_USB	VBUS power supply detection signal
2	D-	D- signal
3	D+	D+ signal
4 to 8	GND	Frame ground

CN403 (Camera Direct I/F)

No.	Signal name	Function
1	POWER	VBUS power supply
2	D-	D- signal
3	D+	S+ signal
4	S-GND	Signal ground
5	F-GND	Frame ground

CN405 (IrDA) [MP450 only]

No.	Signal name	Function
1	S-GN	Ground
2	IR RXD	Receive data signal
3	IR TXD	Transmit data signal
4 to 8	+3.3V	Power supply

CN501 (LF encoder)

No.	Signal name	Function
1	VSEN	Sensor power supply
2	ENCA	Encoder signal phase A
3	ENCB	Encoder signal phase B
4	GND	Ground

CN502 (PE sensor)

No.	Signal name	Function
1	SNS_ASF	ASF sense
2	SNS_PE	PE sense
3	GND	Ground
4	VSEN_3.3V	Sensor power supply

CN504 (Cover sensor)

No.	Signal name	Function
1	DOOR	Cover open sense
2	GND	Ground

CN601 (Memory card)

No.	Signal name	Function
1	+3.3V	Card power supply
2	D-	D- signal
3	D+	D+ signal
4	GND	Ground
5	RESET to Card	Reset signal
6	INT to Card	Interrupt signal
7	+5.0V	Card power supply (for CompactFlash)
8	F-GND	Frame ground

CN602 (Operation panel) [MP450]

No.	Signal name	Function
1, 3	GND	Ground
2	SD_CLK	Clock signal
4 to 7	SD_D0 to D3	Data signal
8	SD_CMD	Command data switch
9	PANEL_INTX	Interrupt signal
10	PANEL_RSTX	Reset signal
11	ERR_LED	Alarm LED output
12	POW_LED	Powre LED output
13	STOP_SW	Stop/Reset button
14	POWER_SW	Power button
15	SNS_HPS	Scanner HPS
16	VSEN	Sensor power supply
17	5V	+5.5V
18	3.3V	+3.3V

CN602 (Operation panel) [MP170]

No.	Signal name	Function
1, 15	GND	Ground
2	3.3V	+3.3V
3	PANEL_RSTX	Reset signal
4	PN_DCK	Panel clock
5	PN_RXD	Panel transmit signal (from the panel board to the logic board)
6	PN_TXD	Panel transmit signal (from the logic board to the panel board)
7	LED1	Not used
8	5V	+5.5V
9	ERR_LED	Alarm LED output
10	POW_LED	Power LED output
11	STOP_SW	Stop/Reset button
12	POWER_SW	Power button

13	HPS	Scanner HPS
14	VSEN	Sensor power supply

CN701 (Carriage motor)

No.	Signal name	Function
1	CR_M	CR motor +
2	CR_MN	CR motor -

CN702 (LF motor)

No.	Signal name	Function
1	LF_M	LF motor +
2	LF_MN	LF motor -

CN703 (Scanner motor)

No.	Signal name	Function
1	SC_MAN	Scanner motor phase A-
2	SC_MA	Scanner motor phase A+
3	SC_MB	Scanner motor phase B+
4	SC_MBN	Scanner motor phase B-

CN801 (Scanner unit)

No.	Signal name	Function
1	VOUT_R	Video input
2	XPH2	CIS resolution switch
3, 12	GND	Ground
4	VCC	CIS power supply
5	REF_V	CIS reference power supply
6	XTG	SH output
7	XPH1	Clock output
8	LED_VCC	LED power supply
9	LED_B	LED drive signal (blue)
10	LED_G	LED drive signal (green)
11	LED_R	LED drive signal (red)

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<Part 3: 2. CONNECTOR LOCATION AND PIN LAYOUT, 2-1>

2-2. MP450 Operation Panel Board L

J1 (Logic board)

No.	Signal name	Function
1	3.3V	+3.3V
2	5V	+5.5V
3	VSEN	Sensor power supply
4	SNS_HPS	Scanner HPS
5	POWER_SW	Power button
6	STOP_SW	Stop/Reset button
7	POW_LED	Power LED output
8	ERR_LED	Alarm LED output
9	PANEL_RSTX	Reset signal
10	PANEL_INTX	Interrupt signal
11	SD_CMD	Command data switch
12 to 15	SD_D0to D3	Data signal
17	SD_CLK	Clock signal
16, 18	GND	Ground

J2 (LCD)

No.	Signal name	Function
1	LED_SHDNX	LED illumination control
2	LED_PWR	LED power supply
3	VDD	+3.3V
4	Vss	Ground
4	LED_Vss	Ground
6 to 13	DB0 to 7	Data signal
14	RDB	Data read
15	WDB	Data write
16	RS0	Register select
17	RSTB	Reset signal
18	CS1B	Chip select

J3 (Operation board R)

No.	Signal name	Function
1 to 4	RA4 to 7	Key scan row address
5 to 7	CA4 to 6	Key scan column address
8	SW_STP	Stop/Reset button signal
9	HPS	Scanner HPS
10	VSEN	Sensor power supply
11	GND	Ground

2-3. MP450 Operation Panel Board R

J1 (Operation board L)

No.	Signal name	Function
1	GND	Gound
2	VSEN	Sensor power supply
3	HPS	Scanner HPS
4	SW_STP	Stop/Reset button signal
5 to 7	CA4 to 6	Key scan column address
8 to 11	RA4 to 7	Key scan row address

J2 (Scanner unit)

No.	Signal name	Function
1	GND	Ground
2	VSEN	Sensor power supply
3	HPS	Scanner HPS

2-4. MP170 Operation Panel Board

J1 (Logic board)

No.	Signal name	Function
1	DGND	Ground
2	VSEN	Sensor power supply
3	HPS	Scanner HPS
4	POWER_SW	Power button
5	STOP/RESET_SW	Stop/Reset button
6	LED_POW	Power LED output
7	LED_ERR	Alarm LED output
8	5V	+5V
9	-	Not used
10	PN_TXD	Panel transmit signal (from the logic board to the panel board)
11	PN_RXD	Panel transmit signal (from the panel board to the logic board)
12	PN_DCLK	Panel clock
13	PANEL_RSTX	Reset signal
14	3.3V	+3.3V

J2 (Scanner unit)

No.	Signal name	Function
1	DGND	Ground
2	VSEN	Sensor power supply
3	HPS	Scanner HPS

J3 (LCD)

No.	Signal name	Function
1	Vss	Ground
2	VLCD1	LCD power supply
3	VDD	+3.3V
4	SEL1	Font select
5	RS	Register select
6	E	Data enable signal
7 to 14	DB0 to 7	Data signal

2-5. Card Slot Board (Card Slot Unit)

Memory card connector [CompactFlash]

No.	Signal name	Function
1	GND	CF ground
2	CF_D3	CF 16 bit data bus
3	CF_D4	CF 16 bit data bus
4	CF_D5	CF 16 bit data bus
5	CF_D6	CF 16 bit data bus
6	CF_D7	CF 16 bit data bus
7	CF_CE0X	CF chip enable
8	GND(CF_A10)	Ground (CF address bus)
9	GND(CF_ATASELX)	Ground (CF ATA selector)
10	GND(CF_A9)	Ground (CF address bus)
11	GND(CF_A8)	Ground (CF address bus)
12	GND(CF_A7)	Ground (CF address bus)
13	VCC	CF logic power supply
14	GND(CF_A6)	Ground (CF address bus)
15	GND(CF_A5)	Ground (CF address bus)
16	GND(CF_A4)	Ground (CF address bus)
17	GND(CF_A3)	Ground (CF address bus)
18	CF_A2	CF address bus
19	CF_A1	CF address bus
20	CF_A0	CF address bus
21	CF_D0	CF 16 bit data bus
22	CF_D1	CF 16 bit data bus
23	CF_D2	CF 16 bit data bus
24	CF_IOCS16X	CF 16 bit access selector
25	CF_CD2X	CF card detect
26	CF_CD1X	CF card detect
27	CF_D11	CF 16 bit data bus
28	CF_D12	CF 16 bit data bus
29	CF_D13	CF 16 bit data bus
30	CF_D14	CF 16 bit data bus
31	CF_D15	CF 16 bit data bus

32	CF_CS1X	CF chip select
33	CF_VS1X	CF voltage sense
34	CF_IORDX	CF read strobe
35	CF_IOWRX	CF write strobe
36	VCC(CF_WEX)	CF logic power supply (write enable)
37	CF_INTRQ	CF interrupt
38	VCC	CF logic power supply
39	GND(CF_CSELX)	CF ground (chip select)
40	CF_VS2X	CF voltage sense
41	CF_RESETX	CF reset
42	CF_IORDY	CF ready
43	CF_INPACKX	CF card response
44	VCC(CF_REGX)	CF register select
45	CF_DASPX	Not used
46	CF_PDIAGX	Not used
47	CF_D8	CF 16 bit data bus
48	CF_D9	CF 16 bit data bus
49	CF_D10	CF 16 bit data bus
50	GND	CF logic ground

Memory card connector [SmartMedia, MemoryStick, SD(MMC)]

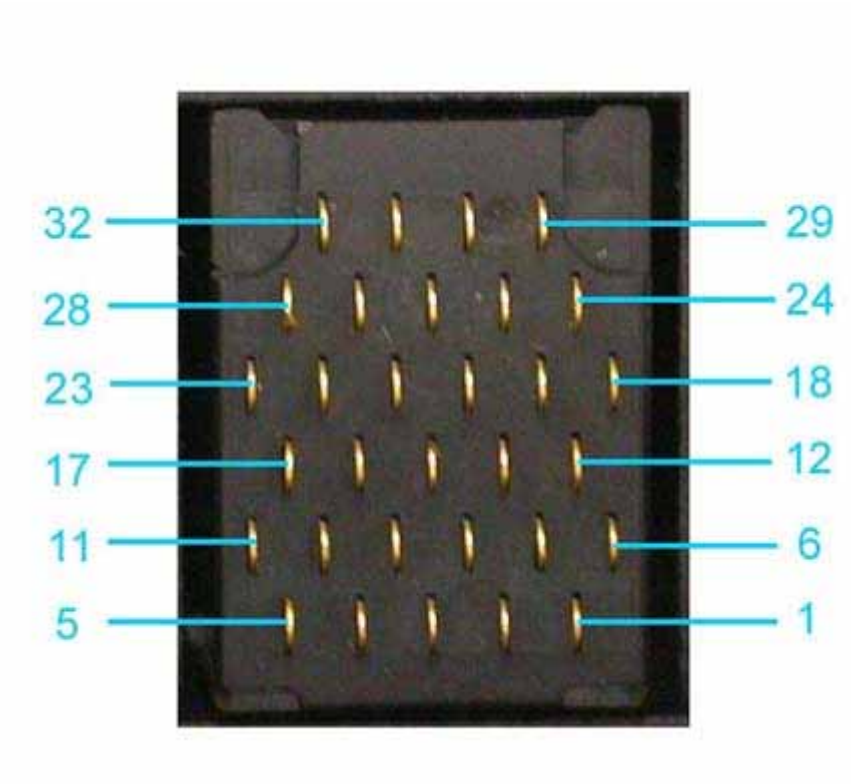
No.	Signal name	Function
1	SM_WPX-IN	SM write protect
2	SM_BSYX	SM busy
3, 7, 11, 13, 15, 36, 37, 41	SM_D0 to 7	SM data signal
4	SM_WEX	SM write enable
5	SM_LVD	SM low voltage detect
6	SM_REX	SM read enable
8	SM_ALE	SM address latch enable
9, 10, 38, 39	SM_GND	SM ground
11	SM_CD	SM card detect
12, 40	SM_VCC	SM logic power supply
14	SM_CLE	SM command latch enable
16	SM_CE	SM chip enable
17, 19, 34, 35	SD_DAT0 to 3	SD data signal
18, 33	MS_GND	MS logic ground
20	MS_Vcc	MS logic power supply
21	MS_SCLK	MS system clock
22	SD_CMD	SD command signal
23	-	Reserved
24, 32	SD_GND	SD ground

25	MS_INS	MS card detect
26	-	Reserved
27	SD_VCC	SD logic power supply
28	MS_DIO	MS data signal
29	MS_VCC	MS logic power supply (MS data signal)
30	SD_CLK	SD system clock
31	MS_BS	MS bus state
42	SM_CDSW	SM card detect
43	SM_CDSW_GND	SM ground
44	SD_CD_GND	SD ground
45	SD_CD	SD card detect
46, 50	Frame_GND	Frame ground
47	SD_WPSW	SD write protect
48	SM_WPSW_GND	SM ground

J1 (Memory card I/F [Logic board])

No.	Signal name	Function
1	+3.3V	Logic power supply
2	D-	Differential data signal
3	D+	Differential data signal
4	GND	Ground
5	RESETX	Reset signal
6	INTX	Interrupt signal
7	+5.0V	Engine power supply
8	F-GND	Frame ground

2-6. Carriage Board (Print Head Connector)



[Color head]

No.	Signal name	Function
1	B_DIA	Diode sensor anode side
2	B_DATA_A	Cyan serial data
3	B_HLAT	Latch signal
4	HCLK	Head clock
5	HENB2	Heat enable
6 to 11	GND	Ground
12 to 15	-	Not used
16	ID4	Head ID
17 to 22	VH	Head drive 24V
23	VID	ID scan power supply
24	VHT	Power supply to drive the power transistor inside the print head
25	DATA_B	Magenta serial ata
26	SGND	Ground
27	-	Not used
28	B_HE1	Heat enable
29	B_CNO	Head contact detect signal
30	DATA_C	Yellow serial data
31	B_HVDD	Head logic power supply

[Black head]

No.	Signal name	Function
1	A_DIA	Diode sensor anode side
2	A_DATA_EVEN	Even nozzle data
3	A_HLAT	Latch signal
4	A_HCLK	Head clock
5	SGND	Ground
6 to 11	GND	Ground
12 to 15	-	Not used
16	ID2	Head ID
17 to 22	VH	Head drive 24V
23	A_VID	ID scan power supply
24	A_VHT	Power supply to drive the power transistor inside the print head
25	SGND	Ground
26	SGND	Ground
27	-	Not used
28	A_HENB0	Heat enable
29	A_CNO	Head contact detect signal
30	A_DATA_ODD	Odd nozzle data
31	A_HVDD	Head logic power supply

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<Part 3: 2. CONNECTOR LOCATION AND PIN LAYOUT, 2-2 to 2-6>

3. PIXMA MP170 / MP450 SPECIFICATIONS

<Machine>

Type	Desktop-type serial machine	
Paper feeding method	Auto sheet feed (auto sheet feeder)	
Resolution	4,800 x 1200 dpi (max.)	
Throughput speed (Target value)	Approx. 45 sec. (PP-101, 4x6, borderless printing, default print quality settings) For reference: Fast / Standard Black (J): 22 ppm / 13.4 ppm Color (J): 17 ppm / 7.8 ppm	
Printing direction	Bi-directional / Uni-directional	
Print width	203.2 mm (216 mm in borderless printing)	
Interface	USB 2.0 Hi-Speed, Direct print port, IrDA 1.2 (MP450 only), Bluetooth 1.2 (MP450 only)	
ASF stacking capacity	Max. 10 mm (Approx. 100 pages of 65 g/m^2)	
Paper weight	64 to 105 g/m^2	
Paper type (max. stacking capacity)	Plain paper, 64 to 105 g/m^2	A4, B5, LTR, A5 ≤ 10 mm; LGL ≤ 10 sheets
	High Resolution Paper HR-101	A4, B5, LTR ≤ 80 sheets
	Glossy Photo Paper GP-401	A4, LTR ≤ 10 sheets; 4x6, Credit Card ≤ 20 sheets
	Glossy Photo Paper GP-501	A4, LTR, 5x7 ≤ 10 sheets; 4x6 ≤ 20 sheets
	Photo Paper Pro PR-101	A4, LTR ≤ 10 sheets; 4x6, 4x8 ≤ 20 sheets
	Photo Paper Plus Glossy PP-101	A4, LTR, 5x7, Panorama ≤ 10 sheets; 4x6 ≤ 20 sheets
	Photo Paper Plus Double Sided PP-101D	A4, LTR, 5x7 ≤ 1 sheet
	Matte Photo Paper MP-101	A4, LTR ≤ 10 sheets
	Photo Paper Plus Semi-gloss SG-101	A4, LTR ≤ 10 sheets; 4x6 ≤ 20 sheets
	Transparency CF-102	A4, LTR ≤ 30 sheets
	T-shirt transfer TR-301	A4 ≤ 1 sheet
	Envelope	COM#10, DL ≤ 10 envelopes
	Photo Stickers PS-101	1 sheet
	Photo Stickers PS-201	1 sheet
Detection functions	- Scanner unit open - Presence of print head - Wrong installation of print head - Remaining ink amount (dot count) - Presence of memory card - Paper presence - Waste ink amount - Internal temperature - Carriage position - Supported camera direct printing device	
Acoustic noise level	45 dB (Printing from a computer, highest print quality, Photo Paper Pro, Fine)	

(Highest print quality)	
Environmental requirements	During operation — Temperature: 5C to 35C (41F to 95F) During operation — Humidity: 10% to 90%RH (no condensation) Non-operation — Temperature: 0C to 40C (32F to 104F) Non-operation — Humidity: 5% to 95%RH (no condensation)
Power supply	Power supply voltage, frequency: AC 100 to 240V, 50/60 Hz Power consumption: Approx. 13 W Standby: Approx. 2 W Power-off: Approx. 0.7 W
External dimensions	With the paper support and output tray retracted: MP450: Approx. 443 (W) x 417 (D) x 185 (H) mm MP170: Approx. 443 (W) x 431 (D) x 181 (H) mm
Weight	MP450: Approx. 6.2 kg (excluding the ink cartridges) MP170: Approx. 5.6 kg (excluding the ink cartridges)
Related standards	Electromagnetic radiance: VCCI, FCC, IC, CE Mark, Taiwan EMC, C-Tick, CCC (EMC), Korea MIC, Gost-R Electrical safety: Electrical Appliance and Material Safety Law (DENAN), UL, C-UL, CB Report, CE Mark, GS, Gost-R, FT, SASO, CCC, SPRING, Korea EK, IRAM (Argentine) Environmental regulations: RoHS (EU), WEEE (EU), Korea Package Recycle Law, Green Point (Germany), Law on Promoting Green Purchasing, Energy Star, Eco Mark
Serial No. location	Label affixed to the chassis (visible when the scanning unit is open)
Remaining ink detection	Available (Detected by dot counting. Reset by user operation. Enabled at default.)
Paper type detection	Not available
Print head alignment	Available. Automatic alignment using the alignment sheet (via the operation panel), or manual alignment using the MP driver Maintenance.

<Scanner>

Type	Flat bed scanner (scanning of a fixed document by a moving scanner head)
Sensor type	CIS (Contact Image Sensor)
Optical resolution	1,200 x 2,400 dpi (max.)
Scanning resolution	1,200 x 2,400 dpi (max.)
Gradation (input / output)	Grayscale: 16 bit / 8 bit Color: 48 bit / 24 bit (RGB each color 16 bit / 8 bit)
Document size	A4 / LTR (max.)

<Copy>

Copy quality	3 levels (Fast, Standard, High)
Intensity	5 levels
Enlargement / reduction ratio	25 to 400%
Copy speed (Fast)	Monochrome (Fine BK): 22 cpm Color (Fine CL): 17 cpm Conditions: The duration from ejection of the first page to ejection of the 11th page in

	continuous copy is converted into cpm.
Document size	A4 / LTR (max.)
Enlargement / reduction	Preset ratio: max. (400%), 4x6 -> A4, 4x6 -> B5, 4x6 -> A5, A5 -> A4, A5 -> B5, B5 -> A4, A4 -> B5, B5 -> A5, A5 -> 4x6, B5 -> 4x6, A4 -> 4x6, min. (25%) Zoom: 25 to 400% (in increments of 1%)
Number of continuous copies	Monochrome / color: 1 to 99 copies

<Card Direct Printing>

Memory card drive	Supported memory card	Compact Flash TYPE I/II, Microdrive, SmartMedia Card, Memory Stick, Memory Stick PRO, SD Card, MultiMedia Card, xD-Picture Card*, miniSD memory card*, Memory Stick Duo*, Memory Stick PRO Duo*
Storage function	Operation	Via the machine buttons.
	Condition	Before changing the settings, the memory card must be removed.
	Function	Read/Write
Card Direct Printing	File format	JPEG (DCF, CIFF, Exif 2.21 or prior, JFIF), DPOF compliant
	Supported print paper	PR-101 (A4, LTR, 4x6) PP-101 (A4, LTR, 5x7, 4x6, Panorama) SG-101 (A4, LTR, 4x6) GP-401 (A4, LTR, 4x6, Credit Card) MP-101 (A4, LTR, 4x6) HR-101 (A4, LTR) PS-101, PS-201 Plain paper
	Print quality	Standard (default), High
	Image correction function	Photo Optimizer PRO, VIVID, noise reduction, face brightener, image optimizer (MP450 only)
	Image adjustment function (MP450 only)	Brightness, contrast, hue
	Image processing function	Not available
	Image retrieval function	Not available
	DPOF	Ver. 1.00 compliant Index printing, printing of an image the specified number of copies, printing of the specified image(s), printing with the shooting date
	Print layout	Single-photo/multi-photo/all-photo printing: 1 photo per page (borderless/with borders, only with borders for plain paper)
		DPOF printing: 1 photo per page (borderless/with borders) 6, 15, 24, 35, 80 photos per page 30 photos per page (panorama)
		Index printing: 6, 15, 24, 35, 80 photos per page 30 photos per page (panorama)

		Layout printing: 2, 4, 8 photos per page (borderless/with borders) Postcard (borderless/with borders, with/without lines) Album (4 photos per page, right/left) Mix 3 types (for A4/LTR)
		Sticker printing: 2, 4, 9, 16 stickers 1, 5, 6, 7 stickers (for free-cut)
	Information print	Date, file number
	Throughput	Approx. 78 sec., with the following conditions and settings: - A photo from a 5 mega-pixel digital camera - PP-101 4 x 6 borderless - Exif print - Standard print quality - Process from pressing the printing start button to ejecting paper

<Camera Direct Printing>

Supported digital cameras	Digital cameras and digital video cameras supporting Bubble Jet Direct or PictBridge
Supported print paper	PR-101 (A4, LTR, 4x6) PP-101 (A4, LTR, 5x7, 4x6, Panorama) SG-101 (A4, LTR, 4x6) GP-401 (A4, LTR, 4x6, Credit Card) PS-101, PS-201 Plain paper
Print layout	- 1 photo per page (borderless/with borders) - Index printing
Resolution	1,200 x 1,200 dpi (max.)
Throughput	Approx. 78 sec., with the following conditions and settings: - A photo from a 5 mega-pixel digital camera - PP-101 4 x 6 borderless - Exif print - Standard print quality - Process from pressing the printing start button to ejecting paper

<Print Beam printing> (MP450 only)

Supported mobile phone	Mobile phone equipped with IrDA 1.2 port, or with Bluetooth 1.2 port
Printable data	Image (JPEG only, text printing not possible)
Supported print paper	PR-101 (A4, LTR, 4x6) PP-101 (A4, LTR, 5x7, 4x6, Panorama) SG-101 (A4, LTR, 4x6) GP-401 (A4, LTR, 4x6, Credit Card) PS-101, PS-201 Plain paper
Supported layout	1, 2, 4, 8 images per page (borderless/with borders) 3, 5, 6 images per page (A4 with borders)

	1, 2, 4, 5, 6, 7, 9, 16 images per page (Photo Stickers with borders)

<Printing via Bluetooth communication (optional BU-20 required)> (MP450 only)

Standard	Bluetooth version 1.2
Output	Bluetooth Power Class 2
Communication range	Good for approx. 10 m in radius (depending on interference between the communication devices, or radio wave conditions)
Frequency band	2.4 GHz
Communication speed	Approx. 720 kbps
Supported profile	BIP, OPP, SPP, HCRP
Supported OS for HCRP	- Windows XP Service Pack 2 or later - Windows XP Service Pack 1 or later: Microsoft "Support for Bluetooth Wireless Devices" or Toshiba Bluetooth Stack for Windows Ver. 3.00.10 or later has to be installed - Mac OS X 10.3.3 or later
BU-20 external dimensions	18.5 (W) x 47.5 (D) x 8.7 (H) mm with a cap
BU-20 weight	Approx. 7 g
BU-20 power supply voltage	4.4 to 5.25 V
BU-20 power consumption	500 mW (max.)
BU-20 operating temperature	5C to 35C (41F to 95F)
BU-20 operating humidity	10% to 90%RH (no condensation)

<Ink cartridge>

Type	Ink-tank-integrated print head
Print head	Bk: 320 nozzles in 2 vertical lines C/M/Y: 192 nozzles in 2 vertical lines per color
Ink color	Pigment-based black; Dye-based cyan, magenta, and yellow
Weight (net)	PG-40 approx. 43 g, CL-41 approx. 45 g PG-50 approx. 51 g, CL-51 approx. 56 g
Supply method	As a consumable

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<PIXMA MP170 / MP450 SPECIFICATIONS>